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CONCERNING THE RESULTS OF OPERATIONS FOR BRAIN TUMOR*

HARVEY CUSHING, M.D.

BOSTON

The broad topic under discussion, the Surgery of Brain Tumors, has many aspects—so many in fact that merely to touch upon all of them would be impossible in a single session. I shall endeavor therefore to confine myself solely to that portion of Professor Küttner's all too brief paper which deals actually with the operative results attained in the Breslau clinic, and shall make no comment on other matters such as earlier diagnosis, Hirnpunction, choked disc, palliative decompression, callosal puncture, the technical features of a craniotomy and so on, though each of them is worthy of detailed consideration.

Any attempt to give a general survey of the subject would lead us as far as would a similar survey of, let us say, the surgery of abdominal tumors—and not long ago, when abdominal explorations were less common, elaborate reports which were made to include the statistical results of operations, were written on this far-reaching subject. A comparison of the operative results, even in the case of specific lesions of specific organs, at the hands of one or another surgeon is sufficiently odious, but when it comes to drawing statistical comparisons of operations for all tumors of all the tissues occurring in all parts of one of the body cavities the proceeding is futile. This is just as true of the intracranial chamber as it is of the abdominal cavity.

In the first place there is no uniform classification for the multiform growths that arise from the meninges and ependyma, from the central or peripheral nervous tissues themselves, or from the epithelial organs, pineal, pituitary and choroid, pertaining thereto. Furthermore, the situation of the lesion is often of importance even greater than its histological nature: whether it arises above or below the tentorium, in the right or left hemisphere, or is superficial or deep; whether it involves relatively "silent" areas or, on the other hand, areas important for life, as the repiratory centers, those important for intellect, for perception or expression, those important for sensation, locomotion, or co-ordination of movements; whether it produces symptoms confined to its immediate neighborhood or distant symptoms through oedema or cerebrospinal fluid obstruction; whether it has led to a great increase in intracranial tension, or the phenomena of this condition are absent; whether it affects special sense tracts or organs, particularly those for sight; whether it produces constitutional symptoms through disturbances on the part of the intracranial glands of internal secretion, and so on—all of these factors so modify the conditions attendant upon an intracranial growth as to make the bare enumeration of operative recoveries meaningless.

The mere feat of removing a tumor is not the only thing to be borne in mind, for this is a sorry accomplishment if the patient is left blind, palsied, aphasic, epileptic, or continues to be intellectually or physically crippled in any way. As Professor Küttner points out, the relief afforded by a well conducted decompression in the case of a tumor which occupies a relatively mute area may be as great and as enduring as when a growth is actually removed from a part of the brain of greater importance to the individual. Many tumors, moreover, are very slow growing and may reach an amazing size before any pressure discomforts or disturbances of vision occur, so that palliative measures, if undertaken at all, guard merely against some future contingency, and an effort to enucleate the growth, even if it is accessible, may be seriously meddlesome. Hence many tumor operations are undertaken only as a last resort, not alone because of tardy diagnosis, but through deliberate choice.

In view of all this there will necessarily be many individual standards for what is to be regarded as "recovery" from an operation for brain tumor. To some it is the actual extirpation of the lesion with preservation of life, but if a high grade of choked disc subsides with greatly lowered acuity of vision, one of the worst symptomatic complications of an intracranial growth persists; if cortical epilepsy continues after the growth is removed we can hardly be jubilant over its removal. If therefore a strict construction is put upon the word "recovery," as it should be, probably none of us see more than a possible 5 per cent. of our patients so "cured." If we can rest content with some persistence of symptoms after a tumor removal possibly an additional 10 per cent. are in this sense "cured," and the individual may lead an effective life, just as he may on recovery from a minor apoplexy which has possibly left some permanent trace of its occurrence. However, if satisfied with alleviation of suffering, preservation of vision and prolongation of life in relative comfort and usefulness, often for many years, certainly 50 or 60 per cent. of all patients can thus be helped. But in any event, even under the most favorable surroundings and with the widest experience and greatest skill it

* From the Peter Bent Brigham Hospital.

* An amplification of a discussion of Prof. Küttner's paper, "The Results in One Hundred Operations Performed on the Diagnosis of Brain Tumor," read before the Section on Surgery at the Sixty-Fifth annual meeting of the American Medical Association in Atlantic City, June 23, 1914.

may be expected that 15 or 20 per cent. of the cases will continue helpless from an uninterrupted progression of symptoms and that a possible 10 per cent. will succumb to the operation, owing usually either to unavoidable loss of blood or to pressure implication of the respiratory center, which as all have observed is particularly apt to occur after subtentorial manipulations.

Obviously, statistics collected from the literature in general are utterly worthless for the purposes which chiefly concern us—namely, the immediate operative mortality and the late results of these operations. Indeed even in the operative series of one individual or of one operative clinic, dependable information concerning these two matters is difficult to secure and a reliable estimate in percentages difficult to make.

A statistical presentation of the results of a comparatively uniform procedure, such for example as the amputation of the breast for malignant disease, becomes complex enough if we go beyond the simple percentage record of immediate surgical fatalities. An arbitrary three-year period of life without apparent return or continuance of the growth was once accepted as the standard of cure, but all of us have seen fatalities after ten or twenty years, or indeed in rare instances have seen patients carry a slowly withering breast cancer without operation for an equal length of time. A number of the patients in my brain tumor series have died from multiple cerebral carcinomatosis, one of them eight and another ten years after an operation for cancer of the breast which had been recorded as cured. Then too in the last twenty years we have seen not only a vast improvement in the breast operation itself, but a consequent readiness of patients to accept early intervention, so that the operative results of the past few years must necessarily be better than those of a decade or two ago; yet while we wait for the statistician to show this the operation will probably improve still further. Thus the prognosis of this year's cases may and should be vastly better than that of a similar group of cases ten or five or even three years ago.

So in brain tumor operations, our present statistics, if they lead us back a few years, must necessarily be built up from the results of operations upon patients with advanced disease, and what makes the matter worse, from the results of operations which in the light of our present knowledge were badly conceived and improperly conducted. Hence, for data concerning permanence of results we must depend on the figures of an era of relatively crude surgery for the figures of a recent era are instructive only from the point of view of immediate mortality. Some years ago a leading neurologist reported one of my cases of cerebello-pontine tumor as the single example in his experience of complete cure of a brain tumor with total disappearance of all symptoms following extirpation of the lesion. Three years later a second operation of the same type was necessitated owing to a reappearance of symptoms from continuance of the growth. In 1904 I removed from the right hemisphere in a young man a large tumor which proved to be a glioma. He remains, after ten years, absolutely free from symptoms, but will this be final in view of the nature of the lesion? In other words, from what we know of gliomata is the patient in a strict sense "cured" of his disease? Then how may we classify the large number of patients presenting a tumor syndrome but in whom no lesion has been certified by operation—lesions which for the nonce may have to be designated as pseudo-tumor cerebri? Often time alone can tell, and in my series cases thus catalogued are continually being reshifted to the true tumor group or elsewhere as further operations become necessary or post-mortem tidings are secured; but many of these individuals, with a competent decompression, live in comfort for years, even if in the end the lesion proves to have been a tumor. Further difficulties arise in connection with the statistical recording of individuals carrying lesions which will ultimately be fatal and yet in whom an immeasurable degree of palliation is afforded by a decompression or a partial tumor removal. I may cite one or two examples of patients who at the present moment are causing me anxiety.

Twelve months ago a physician traveled safely across the continent with a cerebellar lesion which had been permitted to advance so far that not only was he victimized by the characteristic cerebellar syndrome and by the severe headaches, vomiting and choked disc of an obstructive hydrocephalus, but there occurred every few days attacks lasting several hours, of agonizing suboccipital pain, accompanied by opisthotonos and Cheyne-Stokes respiration. In any of these seizures a fatal issue might have been expected. A wide suboccipital exploration was made, and after a ventricular puncture to lower the extreme tension the dura was opened and the edge of a vascular tumor was seen at the side of the right hemisphere. His condition was such as to preclude any attempt at extirpation, and as prompt and complete relief was afforded by this decompressive measure he returned home and actually resumed his practice for six months.

Some return of discomfort brought him back at the end of this period, and a large, exceedingly vascular tumor, the exact cytological diagnosis of which has led to some discussion, was incompletely enucleated from the hemisphere, with so persistent hemorrhage that finally a large piece of muscle was taken from his leg and implanted at the base of the bleeding cavity, after which, owing to his great exsanguination, a blood transfusion had to be made. Here was a close call to an operative fatality, but again his recovery was excellent, and though after this session a unilateral asynergia persisted he traveled and conducted his affairs in comfort.

Now, six months later, having been very well in the interval, he again returns, owing to threatening pressure discomforts. A further attack on the lesion can accomplish no more than the last and is even more likely to be fatal, yet it offers him his only chance of the few more months of comparative activity and freedom from headaches which he eagerly desires. Ultimately, on this basis, whether at the next or a later session, the case will have to be recorded as an operative fatality, unless I balk at what I conceive to be my duty; and without operation he may drag along with increasing discomfort for possibly a year or so.

The other patient to whom I shall refer had a large glioma involving most of the left temporal lobe, which sixteen months ago, after three more or less desperate operative sessions, was in a large part removed, fortunately without injury to her speech mechanism. Until the last few weeks she has been in flourishing health; she has gained 20 pounds in weight, has conducted her complicated household affairs and has traveled abroad. The growth proved to be a glioma, which appeared to be undergoing degenerative changes, and yet there is now a slight fulness at the seat of the operation. In view of her returning headaches should she, at some possible risk of life, be subjected to a further operation at this time?[1]

1. Since this writing both of these patients have been operated upon with a fatality from hemorrhage in the first and a good recovery in the second after an extensive tumor removal.

How shall cases such as the above be classified in the event of death at some future operation? My series contains many examples of this nature with a fatality after a third or even a fourth operation, months or years intervening. From an operative standpoint some credit, it seems to me, should be given for these long periods of release, and hence my analyses will include not only the mortality percentage for the number of patients but also the percentage for the number of operations performed. This is apparently a matter which concerns my clinic more than those of others, for elsewhere, as we shall see, patients are far less often reoperated upon.

Only within the last few years has access through publication been given to the surgical records concerning brain tumors in institutions where comparatively large numbers of these cases have been operated upon. Of the two reports most worthy of consideration one was presented before the London International Congress by Howard H. Tooth[2] and was prepared from the records of the National Hospital during the ten years from 1902 to 1911 inclusive. It is an elaborate study of 265 cases operated upon by Victor Horsley and his colleagues. The other, by von Eiselsberg and Ranzi,[3] presented in the same year before the German Surgical Congress, gives an analysis of 168 cases operated upon in the former's clinic in Vienna, covering a period also of about ten years.

Unfortunately the operative statistics of 109 operations for "tumors of the brain substance" given in Fedor Krause's[4] recent volume and prepared by his assistants are too meagre to be of any great value for a comparative study and are a little difficult to interpret even in their rough details. Finally, those now presented to us by Professor Küttner from his clinic in Breslau, covering a period of six and a half years, comprise 104 surgical interventions in 100 patients with tumor or presumed tumor.

Unquestionably the striking thing in all of these reports is the high operative mortality—a mortality which is too great, I think, to be glossed over by reference to the distressing alternative of the disease left to pursue its own course. In the Breslau series the mortality was 45 per cent., and Professor Küttner estimates the Berlin mortality at 50 per cent. and that of the Vienna clinic at 38 per cent. Tooth's figures, moreover, would lead one to believe that the London operative mortality has been equally staggering.

But here again we are confronted with different standards and personal equations. Tooth in particular has endeavored to fit his analysis to different conditions by tabulating the results of the various operations for the various lesions in the various anatomical subdivisions of the brain. As he admits, the analysis becomes so involved as to necessitate an appendix in which the histories of the 265 cases are individually abstracted; and the tables fail to show the great benefit which the operation has afforded in very many of the cases which fall in the columns of the late or remote fatalities. Cases such as the two of which I have here briefly given the story, if now operated upon without another temporary success would on this basis fall among the immediate operative fatalities, with no credit for the year's relief.[5]

One might indeed assemble his cases into an infinite number of subdivisions—into those fatal at a first operation, those which recover but are unquestionably made worse; those which recover, unaffected and unrelieved; those which recover and in varying degrees are relieved; those which after a period of relief succumb to a second operation; those which remain permanently relieved; those which are explored; those simply decompressed; those in which a partial or total extirpation is carried out—and so on for each part of the brain until we are too addled to figure.

In giving statistics on such a complex subject as that under consideration no one quite knows what the future reader may be seeking. Thus, for our present purposes, the data given by Krause is insufficient. I cannot quite make out whether his tabulated 109 operations include merely all of the cases in which the tumor has been certified by operation or after death, or whether they include also the cases subjected to palliative measures alone. The number surely does not represent his entire series, for in his list of tumors the syphilomas, for example, and the various cysts which he must have encountered do not appear, and an identification of the lesion in 81 cases out of 109 operations is surely a very high percentage. He records that in 19 cases a one-stage operation was planned, with 20 per cent. mortality after the first stage and 20.85 per cent. (?) mortality in the remaining 72 cases which came to a second stage. If these figures are correct it would give an operative mortality of something over 40 per cent. Most of the fatalities were attributed to cerebral softening, to hyperthermia and to pneumonia. This it is most difficult for me to understand, for certainly hemorrhage and respiratory failure from medullary implication, and what we loosely designate as shock, is what most of us chiefly apprehend.

In Eiselsberg and Ranzi's admirable study of their 168 cases, which include a greater number of hypophysial tumors than occur in the other series mentioned, there were 61 operative deaths, 20 from meningitis or sepsis following a cerebral prolapse; 31 attributed to shock or respiratory failure, and the remainder to pneumonia or other complication—an operative mortality of 38 per cent. Professor Küttner states that 45 of his 100 patients died of the operation and its complications, though from what cause he does not say.

Finally, the operative mortality for the 265 cases at the National Hospital is recorded by Tooth as 53.3 per cent., but as I have pointed out and as he himself emphasizes, these figures do not actually convey the impression which they should, for among the cases recorded as fatal are included, to quote from him, "many positive surgical successes, some almost brilliant considering the circumstances, and followed by relief of pain, improvement in sight and mental state, and prolongation of life." It would be illuminating could we have from Horsley or his surgical col-

2. Tooth, Howard H.: Transactions of the Seventeenth International Congress of Medicine, London, 1913, Section VII, Surgery, Part 1, pp. 203-299.

3. Von Eiselsberg and Ranzi: Ueber die chirurgische Behandlung der Hirn- und Rückenmarkstumoren, Verhandl. d. deutsche. Gesellsch. f. Chir., 1913, xxxii, 515-673.

4. Krause, Fedor: Chirurgie des Gehirns und Rückenmarks, 1911, p. 572.

5. As a matter of fact I am greatly surprised that in the series of cases recorded from these four clinics there are so comparatively few secondary operations—only 4 in Professor Küttner's 100 cases and only 17 in the 265 cases from the National Hospital (6.4 per cent.)—whereas in our clinic the percentage of secondary operations is much higher (14.6 per cent.), due doubtless to several factors—to the proclivity toward palliative decompression from a desire to postpone radical measures until we are pretty sure of a localizing diagnosis and to the readiness to reoperaate on recurring lesions.

leagues an analysis of these same cases from the point of view of the operator. It is possible, however, to gather from Tooth's tables the fact that about 52 cases (20 per cent.) died within a few hours, and 32 (12 per cent.) some days after the operation, making an operative mortality of approximately 32 per cent.[6]

However these operative results are to be interpreted, we must all feel hugely indebted to Dr. Tooth and to Professor von Eiselsberg for their invaluable reports, and it becomes incumbent upon others of us to have similar analysis made and published, with the inclusion of case record abstracts, so that subsequent readers with an interest in the subject may cull from them what they will. On this present occasion I can do little more than Professor Küttner has done, namely, to assemble the bare facts to which I have access as simply as I am able.

My own experience comprises 334 cases in my Baltimore tumor series and 142 cases observed in Boston during the past 18 months since the opening of the Brigham Hospital. The number of cases, therefore, for a period of about ten years approximates that from the National Hospital, where 500 cases were the basis of Tooth's studies, 265 of which were operated upon. Of my series of 470 cases about 350 have been subjected to one or more cranial operations. Without a long investigation, impossible with the data at hand, I cannot give the mortality figures relating to the Baltimore series, which, however, when recorded will be of importance largely from the standpoint of permanence of relief. Out of the Boston series of 142 cases, 37 of which were hypophysial tumors, 136 have been operated upon, and concerning these cases the following facts may be given.

To avoid too great detail the growths will be divided into those of the cerebral (supra tentorial) chamber, including the hypophysial cases, and those of the cerebellar (subtentorial) chamber, the pontine tumors being here included. In the list I have not included as "operations" either callosal punctures for the relief of secondary hydrocephalus or the many ventricular punctures performed for diagnostic purposes. Moreover, operations conducted in two or three stages, though necessitating reanaesthetization are recorded as one procedure. Only when a second operation has been undertaken after a long interval is it recorded as another operation.

A. THE SUPRATENTORIAL LESIONS

1. *Cerebral Tumors.*—Of 55 cases listed as cerebral tumors proper, 48 have been operated upon 55 times as follows: subtemporal decompression for an unlocalizable growth, 13; an osteoplastic exploration combined with a decompression in the presence of an irremovable growth or of negative findings, 18; an osteoplastic exploration with disclosure of the lesion and its partial or total removal, or a cyst evacuation, 24. Four of the 48 patients have suffered operative deaths as follows:

(1) A patient in extremis, with diabetes and in status epilepticus, with rapidly recurring seizures of a focal character: exploration without anesthesia; negative findings: continuance of seizures: death in twenty-four hours: a small subcortical glioma at autopsy.

(2) A fatal hemorrhage from the longitudinal sinus on the attempted removal at a second stage of a large endothelial sarcoma involving bone and sinus: closure: death in one hour. (A prompt transfusion might have saved this patient.)

(3) A fatality a few hours after the extensive removal, for the second time, of a recurrent parietal glioma.

(4) Exploratory craniotomy revealing multiple tuberculomata, with early fatality (7 days).

Strictly speaking only the second and third of these fatalities was precipitated by the operation. In the other two death without operation was imminent, and in this connection it may be noted that four of the unoperated patients in the series died in the hospital soon after admission and before studies preparatory to operation could be made.

2. *Tumors of the Hypophysis or its Neighborhood.*—Owing to a secondary hypophysial involvement, a large number of the basal and interpeduncular tumors have been included in this group, together with the primary pituitary tumefactions, making 37 cases in all. In these 37 cases 42 operations have been performed as follows: subtemporal decompressions, 20; transsphenoidal operations on the sella with decompression, 2, with partial extirpation of the lesions, 15; osteoplastic frontal operations, 5. There have been two deaths:

(1) A fatality from cerebral compression eighteen hours after a transsphenoidal operation, the third operation on this same individual after long intervals.

(2) The removal in toto of an interpeduncular tumor at a second stage by the frontal route.

3. *Pineal Tumors.*—Owing to our interest in matters relating to the ductless glands this small group is recorded separately. There have been four cases, two of them certified by autopsy, the patients dying in the hospital without operation. One of the living cases was explored with negative findings.

B. THE INFRATENTORIAL LESIONS

1. *The Cerebellar Group.*—There have been 32 patients, all but three of whom have been operated upon, and all told there have been 36 operations. All of the procedures have been of the same extensive type, with a "crossbow" incision and a bilateral exposure with posterior removal of the foramen magnum, often combined with a ventricular puncture and occasionally with removal of the arch of the atlas. In only one instance was the operation conducted in two stages. In 10 of the cases the lesion has not been exposed and its situation remains uncertain; in 12 it proved to be intracerebellar; in 7 it was extracerebellar.

There were 18 explorations which were abandoned as decompressions, for in 16 of them either no lesion was disclosed or if disclosed and presumably operable the patient's condition precluded further manipulations (no fatalities), and in the other 3 a large posterior and mesial, and obviously an irremovable tumor, presented itself (all three cases fatal).

There were 17 partial or presumed total extirpations or cyst evacuations, 2 of them cases which had been previously explored, with negative findings, 7 of them cases in which an earlier partial extirpation had been performed. There were two deaths from the operation.

6. A review of the case abstracts leads to the impression that 99 of the fatalities are attributable to the operation (an operative mortality of 37.3 per cent.), whereas 11 others are questionable. There were 17 more or less acute and fatal infections; 14 fatalities associated with a recorded fungating hernia and discharging wound, and a number of cases of like nature without definite details, showing that there were at least 31 cases of fatal sepsis out of the 99 fatalities, making a percentage of about 30 due to this cause.

Thus in the 29 cases subjected to operation there have been 5 fatalities attributable to the operation (a 17 per cent. case mortality and 13 per cent. mortality for the 36 operations). The fatalities may be detailed as follows:

(1) A young girl with profound pressure symptoms and a cerebellar syndrome had a sudden cessation of breathing the night of her admission. Dr. Bagley attempted an emergency decompression without success. At autopsy a large enucleable tumor was found lying between the two cerebellar hemispheres and flattening the medulla.[7]

(2) Exposure of a large mesial posterior vascular tumor: respiratory cessation on the table: autopsy: a vascular glioma flattening the medulla.

(3) Exposure of a pial endothelioma with conditions practically corresponding to those in 1 and 2:[8] early death (8 hours) from respiratory failure.

(4) A young girl first decompressed (Baltimore series) in 1910; subsequently a partial glioma enucleation by another surgeon (1912); return of symptoms, 1914: successful enucleation of a huge glioma occupying most of the subtentorial chamber. Death on sixth day from streptococcus meningitis.[9]

(5) A young boy, first decompressed (Baltimore series) 1910: subsequently in 1912 a partial enucleation of a glioma of the right hemisphere: return of symptoms with bizarre paralyses, 1914: fatal issue two hours after further enucleation of the large recurrent growth: autopsy: gliomatous extension throughout the entire spinal canal and over base of brain.

3. *Pontine Tumors.*—Five cases have been diagnosed as pontine gliomas—one certified by autopsy after some months. Four of the cases have been operated upon without fatality—and, as may be added, with practically no alteration in the condition. In 3 a subtemporal decompression, and in one a suboccipital exploration, was performed.

C. THE PSEUDO-TUMORS

At present 23 cases are recorded under this diagnosis, and of this number 11 have been operated upon owing to pressure phenomena. Two or three cases originally so grouped have since been shifted to the true tumor list (in one a glioma was disclosed at autopsy, in two others a glioma was found at a second operation). A few others have been removed from this group, as a late examination has shown an abscess or vascular disease, or cerebral lues, or a meningitis serosa, which simulated tumor. A number of other cases not operated upon as yet will doubtless in time come to operation. Hence this particular group is difficult to handle, and probably "questionable" rather than "pseudo" would be a better group designation.

There have been no fatalities in this group, in which there have been 4 exploratory craniotomies combined with a subtemporal decompression, 4 subtemporal decompressions, and 3 suboccipital explorations and decompressions.

A summary of these cases may be tabulated as follows, showing a case mortality for the 130 patients operated upon of 8.4 per cent. and the operative mortality for the 149 operations of 7.3 per cent.

SUMMARY OF CASES

	Cases Observed	Operated Cases	Times Operated	Operative Fatalities
Supratetorial cases	55	48	55	4
Hypophysial cases	37+	37	42	2
Pineal cases	4	1	1	0
Cerebellar cases	32	29	36	5
Pontine cases	5	4	4	0
Pseudo-tumors	23	11	11	0
	156	130	149	11

The following assemblage of the 149 individual operative procedures for the entire series may be given.

Subtemporal decompressions, 41 (no fatality).

Osteoplastic craniotomies combined with cerebral decompression, 28 (3 fatalities).

Osteoplastic craniotomy with attempted partial or total removal of the tumor 24 (2 fatalities).

Transsphenoidal operations for hypophysial tumor, 17 (1 fatality).

Suboccipital exploration and decompression, 22 (3 fatalities).

Suboccipital operations with attempted partial or total removal of the lesion, 17 (2 fatalities).

In this group of 130 surgically treated cases the 70 certified lesions have been as follows. Glioma and gliomatous cyst, 27 (cerebral 18, cerebellar 9); endothelioma, 7 (cerebral, 2, cerebellar, 5); angioma (endothelial ?), 2; sarcoma, 1; carcinoma (metastatic), 1; syphiloma, 4; tuberculoma, 4; osteoma, 1; echinococcus, 1; adenoma, 17 (hypophysial, 15, pineal, 2); interpeduncular mixed tumors, 5. It may be added that a few of the lesions which are histologically difficult to classify have been put with the gliomas, on the basis of the finding of a few glioma fibrils.

In order to show the type of cases we have included and of those we have excluded from the operative fatalities I may mention the 3 tuberculous cases. In one of them, recorded as a fatality, the patient was in extremis, with pulmonary tuberculosis, but owing to his intense discomforts an operation was undertaken—an exploratory craniotomy which better judgment would have made a simple decompression. There was great tension of the hemisphere with extensive tuberculosis radiating from a large tuberculoma—an inoperable condition. He died 7 days after the operation. The two other patients, not included with the operative fatalities though both of them subsequently died, were children. In one of them a simple suboccipital decompression was performed with no apparent change in the condition. A few weeks later he was removed to his home, where death occurred shortly afterwards, and a fragmentary autopsy disclosed a cerebellar tubercle. The other, a child of 3, died in the hospital three months after a successful extirpation of two large tuberculomas from the left cerebellar hemisphere. The postoperative conditions were perfect, with great improvement in the child's condition, but after a month's time a progressive hemiplegia set in, with ultimate death and the disclosure at autopsy of a third tubercle in the left crus cerebri and a basilar meningitis.

Cases of this sort, I am aware, if placed among the surgical fatalities would considerably increase their number, but even if they are to be included I nevertheless feel that the recorded mortality percentages from foreign clinics convey an absolutely erroneous idea of the immediate surgical risks of brain tumor operations. I can hardly imagine an optimism sufficient to carry a surgeon into a class of work in which

7. The case might justifiably not be included among the operative fatalities. However, I have once succeeded in saving a patient under similar circumstances, with resumption of spontaneous breathing on the operating table after evacuation of a cerebellar cyst, *45 minutes after the sudden cessation of respiration in the ward!*

8. It is unusual to meet with three cases like the above in a small series. But for their situation the growths would have been enucleable, and though lying largely within the cerebellum they were in a strict sense probably all extracerebellar.

9. I grieve to record this my single fatality from meningitis in the entire series. It was a long performance and the operating room orderly who held the head during the preliminary preparations was ill and was confined to bed the following day with a streptococcus throat and scarlet fever.

one out of every two or three patients dies obviously from one's intervention, well intentioned though it may be. It is possible that we have estimated our percentages on a different basis, for otherwise I can hardly account for the discrepancy between the figures which I have given and those of the major foreign clinics where these operations in considerable number are undertaken. Still another explanation lies in the fact that these Brigham Hospital figures represent an experience of only the past 18 months, whereas the figures from Breslau, London, Berlin and Vienna comprise the experiences, in some cases, of a decade and reach back to a time when for many reasons the expectancy of life after such procedures was doubtless less than it is today.

However this may be, I nevertheless feel that the effects of concentration of work show themselves in our results, which depend so greatly on such details as perfection of anaesthesia, scrupulous technique, ample expenditure of time, painstaking closure of wounds without drainage, and a multitude of other elements, which so many operators impatiently regard as trivialities. Certainly infections cannot be attributed to the intervention of the devil but must be laid at the surgeon's door. We have had no example of wound infection of any kind with the single exception of the wildfire case of meningitis which I have recorded, and such a thing as a fungus cerebri after an operation is unknown in our experience, owing I think to the careful closure of the galea with interrupted silk sutures which is invariably practiced, for on this buried layer the strength of the wound depends, the skin sutures being removed usually in 48 hours. Krause has the enviable record of no instance of meningitis in his series, whereas a great opportunity for improvement is shown by the 10.5 per cent. mortality from meningitis in the Vienna series and the still higher percentage (11.7 per cent.) of deaths recorded as due to sepsis at the National Hospital.

After all this wearisome and embarrassing comparison of operative statistics I may be permitted to return to the theme of my opening paragraphs, where it was pointed out that the discussion of this whole subject would cover too large a ground, including as it does all tumors of all kinds in all parts of the cranial chamber. The time has come when for proper advance we may well devote our analytical studies of operative results to specific types of lesions in specific localities, as, for example, the hypophysial tumors, the cerebello-pontine lesions, the cerebellar gliomas, the endothelial tumors, tumors of a metastatic or infectious origin, and so on. This I have already attempted to do, in a paper printed in this journal,[10] with the hypophysial cases, which henceforth may well be excluded from the "brain tumor" series. Only in this way may we arrive at a better understanding of what actually are the probabilities of recovery from an operation of a given type upon a particular lesion.

Confused as one may remain in regard to the results from this or that clinic when the entire subject is considered, when it is brought down to a single topic a comparison is much clearer. Let us, in illustration, consider for a moment the cerebello-pontine (acoustic or lateral recess) tumors. Long ere this the general principles of attack upon these supposedly enucleable and easily diagnosed tumors should have been a matter of common knowledge. But there is no agreement as to whether there should be one or two stages, a bilateral or a unilateral exposure, an osteoplastic operation or otherwise, an approach through or to the side of the cerebellum, an attempt at a total enucleation or not, drainage of the wound or otherwise, and so on. It is a procedure accredited with a very high mortality. In 24 such operations Krause has had 20 fatalities; von Eiselsberg in 17 cases lost 2 after a first-stage, and of the remaining 15, 10 of the 11 in which there was an attempted tumor removal died of shock; 24 of the 36 cases operated upon at the National Hospital died from the effects of the operation (9 after a decompression, 15 after a partial removal, 5 of sepsis).

This gives for the 77 cases in the three clinics a 72.7 per cent. average mortality, which is of course appalling for an operation upon a lesion possibly the easiest to localize of all intracranial tumors; and as Tooth says, the only hope of lowering the mortality in these cases is by a modification of the surgical procedure. The direction of this modification lies, I think, in performing these suboccipital operations with a bilateral exposure and in one instead of two stages; in carrying through the elaborate approach to the lesion with complete haemostasis, even though it means a two hours' labor; in lowering tension by an occipital puncture of the lateral cerebral ventricle; in removing the posterior half of the foramen magnum, and possibly, in case of great cerebellar herniation through the foramen, the arch of the atlas as well; in being content, in view of the obvious impossibility of a total enucleation of the growth, entangled as it is in the nerves and vessels of the lateral recess, with the mere splitting of the comparatively non-vascular lesion with subsequent scooping out, on each side, of as much tumor tissue as possible, leaving its capsule in place; in accurate closure of the wound in layers without drainage; in leaving the patient in the face-down position on the table if necessary for hours should there be any question of threatened respiratory difficulty; in the willingness to give an entire morning of three hours at least to such an undertaking.

My own series, going back ten years, contains 13 of these cases which have been certified by operative exposure and 17 cases in which the diagnosis of a cerebello-pontine tumor was made but in which the operation was concluded as a decompression, short of laying bare the lesion. It is possible that there may be still other unrecognized cases, but these are possibly offset by others again in which a previous diagnosis of a cerebello-pontine lesion has been proved erroneous by the finding of an intracerebellar lesion at a second operation, I having had several experiences of this kind. None of the 17 cases with a decompression alone have been fatal. There have been 4 fatalities in the 15 operations on the 13 patients with a certified lesion; one of them from a pneumonia following my first operation of the kind—a sorry attempt ten years ago—and the three others from bulbar symptoms after more or less extensive fragmentary enucleations. Though the series is admittedly small, this gives a mortality for the 13 certified cases of about 30 per cent., and if the suspected cases are included, of only 13 per cent. Indeed, we do not share the view, which seems to be held in other clinics, in regard to the extreme surgical risks of subtentorial operations in general, though admittedly they are greater than in other intracranial procedures. Still, I realize fully that we may be riding to a fall, and

10. Surgical Experiences with Pituitary Diseases. The Weir Mitchell Lecture, THE JOURNAL A. M. A., Oct. 31, 1914, p. 1515.

that our cases may have been brought to us earlier and thus the operations on the average have thus far been 50 per cent. easier and less hazardous than in the other clinics.

Unquestionably the general results of the efforts on all sides to give relief by surgical measures to individuals suffering from tumors of the brain are perceptibly improving and the mortality percentage is being constantly lowered. There are two underlying reasons for this. One is the great improvement in technical methods of performing these admittedly difficult operations since the days when von Bergmann gave his pronouncement of their hopelessness except in the case of tumors of the paracentral zone. Disastrous have been the attempts to apply to intracranial procedures the same rough surgical methods which the abdominal viscera and their coverings tolerate but against which the central nervous tissues rebel. Surgical manipulations of an entirely different order from those permissible elsewhere in the body are essential to success in intracranial performances, and they demand special training.

A second and equally important reason for the recognized improvement in neurological operations concerns the changed attitude of the surgeon toward the subject, for as I have frequently emphasized he should be able to make his own neurological examination. No notable advance was ever made along any line of manipulative handicraft so long as the operator remained merely the tool to execute a procedure directed and conceived by another who alone assumed the responsibility of a diagnosis. The neurologist has been as quick to appreciate this as has the internist in the case of surgical performances for the disorders of the abdominal organs, which were once his special domain.

There is a prevalent view, due undoubtedly to the sorry experiences of the past and the bungling results of the untrained at the present time, that all of these operations for brain tumor should be undertaken only as a last resort when the clinical features of the case have become outspoken and the sorry plight of the victim can hardly be made worse, whatever the outcome of an operation. History repeats itself. There was a similar chapter in the story of the appendix, the gall-bladder, the pylorus and the thyroid, to give only some very modern instances. Still, if an intracranial exploration is attended by extraordinary risks this is indeed a justifiable view; so that the first thing that one must be able to assure his patient, his patient's councilors and himself, is that there is no great hazard in an exploration and a probability of improvement even when no tumor is revealed, or one which no attempt should be made to remove. This, indeed, is more than can be said of most of the purely exploratory operations performed for new growths involving the abdominal organs, for at best the closure of a laparotomy wound, in the face of an inoperable lesion, leaves the patient's condition unaltered, whereas a properly conducted craniectomy is in itself often beneficial.

There are certain things which make this assurance possible. Far from the least important is the smooth administration of the anaesthetic by one who is specially trained for its administrations in these difficult cases. Again, these procedures should never be attempted in unaccustomed surroundings: it is far safer to transport an ill patient to a well organized surgical machine than it is to operate awkwardly with a makeshift team in unaccustomed surroundings. The technical steps are delicate; the performances are time-consuming; wounds must be left dry before closure and closure must be without drainage; patients if in a critical condition may needs remain unmoved on the operating table for many hours; a donor should be in readiness for transfusion should there be an excessive loss of blood; absolute perfection of wound handling and wound closure must be observed, with early removal of sutures, for in many cases of tumor removal two, and even three or four, stages must be anticipated. Then even at home one cannot justifiably crowd difficult and responsible operations of this type into a busy operating schedule, even if they could be done with greater speed than we at least feel justified in making. Some of our neurological friends have long placed more emphasis on speed than on care, and indeed from the onlookers' seats these detailed performances must often seem utterly tedious, but it is a familiar adage that the grandstand is a poor place from which to conduct the play.

I have amplified this discussion to an unexpected and possibly unnecessary length in my attempt to register the conviction that to group together all the operations for all tumors which arise anywhere in the cranial chamber and to consider percentages gained by such a process, is largely a waste of time and a possible abuse of figures. Unquestionably the time has come for us to concentrate upon individual lesions in individual situations if, through comparative studies, we are to increase our technical facilities and improve our mortality results.

Specialization with some knowledge of neurology, skilled assistance—for intracranial operations are not star performances—familiarity with the safe and respectful handling of the central nervous tissues, which is best acquired by the experiences of the experimental laboratory, and painstaking, scrupulous technique, are the chief elements of success. An observance of these things will not make more tumors accessible, but it will permit the removal of those that are accessible to be more often accomplished and render those that are not, capable in a larger percentage of cases of being safely palliated.

The Peter Bent Brigham Hospital.

The Unbalanced Antivaccinationists.—There is something about the antivaccination propaganda which appeals with irresistible force to a certain type of unbalanced mind. Of every ten letters written to the *Journal* against vaccination, six belong to a well-marked type. They bristle with adjectives, mostly uncomplimentary ones. They repeat certain phrases over and over again. They overflow with statistics of things that never happened. They impute the most evil motives to all who differ from their pet "ism." Their argument, if present at all, runs in a circle: "I hate vaccination because it is poison, and I know it is poison because I hate it." They show an utter disregard of facts, they ignore the plainest evidence that conflicts with their views, and put absolute faith in the wildest, craziest tales that agree with their preconceived notions. The writers of these epistles may not be insane, doubtless are not, in the usual sense of the word. Neither are they persons whom a thoughtful citizen would choose as trustees of his estate or guardians of his children. They do not stand alone in their opposition to vaccination—if they did, the task of sanitary officers would be easier than it is—but they do furnish a large part of the misdirected energy whose sole effect is to perpetuate a loathsome and dangerous plague.—Chicago *Daily Journal*.

THREE CASES OF EXTRAPERITONEAL CESAREAN SECTION*

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Probably none of our operative procedures has had a more rapid growth and development than cesarean section. Within the brief span of ten years it has undergone a wide extension of its scope and radical changes in its technic. It was formerly applied only as a measure of last resort and was altogether limited to cases of dystocia due to extreme contraction of the pelvis. When the suggestion was first made to perform cesarean section in placenta praevia, it provoked rather strong opposition (Ehrenfest[1]), but the indication has, of late, been upheld by many writers (Bumm, Kroenig, Nagel,[2] Kohlmann[3] and others). The therapy of eclampsia is still a mooted question, yet those who advocate active intervention and include cesarean section among the means of quickly evacuating the uterus are by no means less numerous than the adherents of an expectant mode of treatment (Peterson[4]). Craniotomy has properly been denounced as an unjustifiable procedure except in rare instances, and in proportion cesarean section has been brought to the fore. The induction of premature labor in cases of moderate contraction has, in hospital and clinical practice at least, shown considerable disadvantage and the future fate of the infants has been so far from satisfactory that cesarean section has been advocated as a preferable alternative. Then, we find scattered in literature occasional indications for cesarean section, such as premature separation of the placenta (Küttner[5]), uncompensated heart disease (Kreiss[6], Barris[7]), edema and varicosities of the vulva (Brunet[8]), prolapse of the parturient uterus (Warren[9]), complication with ovarian cyst (Broadhead[10]). And finally, it has been claimed quite recently (Newell[11]) that many modern women, weakened as they are by the deteriorating influence of hypercivilization, can but badly stand the strain even of a normal labor and have to pay dearly for the privilege of motherhood by a prolonged, if not lifelong, invalidism, but that such patients will undergo and recuperate rapidly from a cesarean section.

This amazing multitude of new indications can be explained in part by the fact that, since Saenger, in 1882, presented us with the technic of the "classical" cesarean section, modern antisepsis and asepsis have steadily reduced the mortality of this operation until it reached its low water mark of 12 per cent. in 1904 (Nicholson[12]). In selected cases the mortality has sunk as low as 2 per cent. (Boyd[13]), and in the hands of particularly experienced operators has become still further diminished to a negligible quantity.

But where there is much light there must be shadow as well, and as the number of cesarean sections increased, certain undesirable after-effects became apparent. The unsightly abdominal scar with its ever-present tendency toward hernia was, perhaps, the least untoward sequel. Much more serious was the frequent, nay, the almost constant, occurrence of post-operative adhesions, the unintentional ventrofixation of the uterus, with its train of annoying symptoms, the possibility of ensuing miscarriages, or the danger in future deliveries from the pathologic immobilization of the uterus.

Thus it was that a number of modifications came into being, among which the "high" incision of Davis[14] has more recently become popular, because it was claimed that adhesions could thereby be prevented.

The classical cesarean section and its modifications had this premise in common, that the case to be operated on had to be "clean," that is, the membranes had to be intact or but quite recently ruptured and previous examinations and attempts at delivery had to be strictly avoided. Now and then fortune may favor with impunity one who ignores these precautions,[15] but, as a rule, trespassing is quickly followed by infection and death.

There still remained, then, a large number of so-called "unclean" cases in which infection was already established or the precautions enumerated had not been observed, or else "suspected" cases in which there was some doubt as to the proper preoperative handling. It was for just such cases that Frank of Cologne, in 1907, invented a new method of cesarean section called "extraperitoneal," which was in all essentials identical with an operation originated by Thomas of New York in 1870, but since fallen into oblivion. The principle of the new method was to make the incision into the lower uterine segment instead of into the fundus, and to exclude carefully the operative field from the rest of the peritoneal cavity. That Frank's procedure filled a long-felt want and was published at the psychologic moment was shown by the stormy enthusiasm it kindled abroad and the large number of more or less radical modifications. An interesting and exhaustive résumé of the development of extraperitoneal cesarean section has been written recently by Nicholson.[12] For us it may suffice to say that extraperitoneal cesarean section did not fulfil the hopes originally placed in the new procedure. Patients already infected could not be saved by it. Brilliant results, however, were obtained when the operation was performed on "suspected" patients, and even more so when it was employed in aseptic cases.

It will not be necessary to concern ourselves in detail with the numerous modifications of technic. The bewildering particulars of the various procedures are of interest more to the specialist. To a general audience, however, it must be of importance to realize that these newer operations offer advantages far in advance of the more generally known methods of cesarean section. This, I trust, will become apparent from a description of the three cases of extraperitoneal cesarean section which I have had occasion to perform in the last eight months.

CASE REPORTS

Case 1.—Mrs. J. L., 35 years old, had her first confinement three years ago. After a long labor a dead child was extracted with forceps. A year later she had a miscarriage.

* Read before the St. Louis Medical Society, Oct. 3, 1914.

1. Ehrenfest, H.: Am. Med., January, 1902.
2. Nagel, W.: Surg., Gynec. and Obst., 1914, xix, 82.
3. Kohlmann, W.: New Orleans Med. and Surg. Jour., 1914, lxvi, 655.
4. Peterson, R.: Am. Jour. Obst., 1914, lxix, 582.
5. Küttner, O. J.: abstr. Zentralbl. f. Gynäk., 1914, xxxviii, 1197.
6. Kreiss, P.: Zentralbl. f. Gynäk., 1913, xxxvii, 1805.
7. Barris: Jour. Obst., Brit. Empire, April 4, 1914.
8. Brunet: Ztschr. f. Gynäk., 1908, lxiii, 124.
9. Warren, S. P.: Am. Jour. Obst., 1914, lxix, 432.
10. Broadhead, G. L.: New York Med. Jour., 1914, xcix, 1192.
11. Newell, F. S.: New York State Med. Jour., February, 1914.
12. Nicholson, W. R.: Surg., Gynec. and Obst., 1914, xviii, 244.
13. Boyd, G. M.: Am. Jour. Obst., 1914, lxx, 439.
14. Davis, A. B.: Am. Jour. Obst., 1913, lxviii, 1017.
15. I have reported[16] a case of cesarean section performed elsewhere on a dead child after numerous fruitless attempts with forceps had been made in the house of the patient. This woman recovered from the operation but had a serious dystocia at her next confinement.
16. Gellhorn, G.: Mo. State Med. Jour., 1910, vi, 632.

Jan. 27, 1914, she again was in labor at full term. She had had moderately severe contractions for about forty-eight hours and very strong and frequent pains for about eight hours. At midnight I was called by the two physicians in attendance to perform cesarean section. The membranes had ruptured a considerable time previously, and repeated vaginal examinations had been made *without rubber gloves*.

I found the patient of medium height, with a moderate kyphoscoliosis and a generally contracted pelvis of mild degree (Sp. 22½ cm.; Cr. 26½ cm.; Conj. ext. 19 cm.). The fetal heart-beats were on the left side near the flank. In the upper part of the vagina there was an annular constriction due to scar tissue, the result of her first delivery. The fetal head could hardly be reached from below, nor could it be impressed into the pelvis. The child was obviously very large, to judge from the size of the abdomen. The uterine contractions were becoming weaker but were still frequent.

The indications for a cesarean section were, then, clearly given: a contracted pelvis, a large head in occipitoposterior position, freely movable above the pelvis in spite of fifty-four hours of incessant contractions; secondary inertia; and the history of former dystocia.

It was equally clear, however, that any intraperitoneal cesarean section was contraindicated, for not only had the membranes been ruptured for a considerable space of time, but repeated examinations had been made with ungloved hands, and, perhaps, without the most strict observance of antiseptic precautions. There was, as yet, no fever, but the possibility of an infection, however mild, pointed to the necessity of choosing the extraperitoneal route for the cesarean section.

The steps of the operation were as follows: The patient was catheterized and narcotized with ether. One cubic centimeter of pituitary extract was injected intramuscularly. In extreme Trendelenburg position a midline incision was made from the symphysis to within 1½ inches of the umbilicus. The lower uterine segment distended by the child's head, presented. The peritoneum, which, in pregnancy, is only loosely attached to the lower uterine segment, was lifted with a tissue forceps at its highest point which corresponded to the upper end of the abdominal incision, and transversely incised a distance of about 2 inches. The peritoneum, and with it the bladder, was then gently pushed toward the symphysis with the finger or a sponge in the fashion of a hysterectomy until the firmer connection between bladder and cervix called a halt. The engorged veins at the base of the bladder now became visible and were protected from injury by a large retractor which at the same time held the bladder against the symphysis. A denuded oval with a diameter of about 5 inches thus resulted on the anterior surface of the lower uterine segment. The parietal peritoneum was now stitched to the edges of this denuded oval by means of a continuous catgut (or linen) suture and thereby a complete closure of the abdominal cavity was produced which rendered the rest of the operation absolutely extraperitoneal. Then followed the incision through the lower uterine segment within the entire extent of the denudation and the opening of the amniotic cavity. The child's face was rotated into the uterine incision by placing a finger into the child's mouth. While an assistant held the face in this position, a forceps was applied with the concavity of the blades toward the symphysis and the head gently extracted. The body followed immediately. The child, a female, weighing 10¼ pounds, cried at once. Placenta and membranes were removed instantly and a hypodermic injection of ergot was given. The uterine incision was closed by through and through interrupted sutures of chromic (or tanned) catgut No. 2 and a superficial running suture of finer catgut. The denuded area was cleansed with hot saline solution, and dried with sponges. The uterus contracted promptly and there was practically no bleeding throughout the operation. The continuous stitch between parietal and visceral peritoneum around the denuded area was now removed, the bladder peritoneum pulled over the entire wound and sewed on the anterior surface of the uterus a trifle above its original insertion by means of three or four interrupted (or continuous) sutures. The operation was concluded by closing the abdominal incision in the usual way.

The patient went through an undisturbed and afebrile puerperium and left the hospital within two and a half weeks.

Oct. 3, 1914, the patient was in the best of health. There was a strong linear scar. The uterus was of normal size, position and mobility. The child was thriving.

CASE 2.—Mrs. P. H., 25 years old, colored, a dwarf with coxa vara and a deformed knee-joint. Pelvic measurements were as follows: Sp. 24½; Cr. 25; Tr. 33½; Conj. ext. 21½. The pelvis was of the Naegele type of oblique contraction: the anteroposterior diameter lengthened, the transverse diameter asymmetrically shortened due to the fact that the entire left pelvic wall was pushed inward. The child was in L. O. A. position. Although natural delivery seemed quite improbable, it was decided to give the patient the test of labor. Consequently, when labor commenced on June 6, 1914, 6 drops of pituitary extract were injected in order to intensify the contractions. Vaginal examinations had carefully been avoided for several weeks. After twelve hours the head was still freely movable above the pelvis and cesarean section clearly indicated.

The technic of the operation was identical with that employed in the first case, except that it was performed in spinal anesthesia. A male child, weighing 5 pounds 1 ounce and crying at once, was delivered. There was no bleeding during the operation. Convalescence was rapid and undisturbed. Three months later the patient was demonstrated before a number of physicians. The abdominal scar was firm, the uterus small, in normal position. Child well.

CASE 3.—Mrs. A. J., 22 years old, primipara, has always been delicate and poorly nourished. Systolic blood-pressure ranged between 88 and 102 throughout pregnancy. Pelvic measurements: Sp. 20 ½; Cr. 24½; Tr. 28½; Conj. ext. 18½. Aug. 27, 1914, she had been in labor at full term for the past thirty-eight hours. Contractions were regular but only moderately strong in spite of repeated injections of small doses of pituitary extract. The fetal head remained movable above the pelvis. The cervix was ½ inch in length and open for two fingers. The patient showed signs of exhaustion.

The indications for surgical delivery in this case were as follows: Generally contracted pelvis of moderate degree; a large child; primary inertia; delicate and exhausted mother. The technic of the operation coincided in all details with that of Case 1. A female child of 7 pounds 6 ounces, crying at once, was delivered. Recovery was rapid.

Oct. 23, 1914, the patient was perfectly well. Strong linear scar. Uterus of normal size, position and mobility. Child well.

The technic employed in the three foregoing cases has been slightly modified from the one depicted by Kroenig[17] and originated by Veit and Fromme. As appears from the description, it is strictly speaking a transperitoneal method. The parietal peritoneum is first incised, then the visceral peritoneum is pushed off the lower uterine segment and, finally, by stitching the parietal peritoneum to the uterus, the free abdominal cavity is excluded and the operation rendered extraperitoneal. Of the twenty different methods of extraperitoneal cesarean section enumerated by Nicholson, this one appeals to me most strongly because of its simplicity, safety and elegance of procedure. Its superiority over the classical cesarean section, with or without lifting the uterus from the abdominal cavity, is at once apparent.

In the classical cesarean section we have, as pointed out above, an enormous scar with a proportionately increased possibility of hernia; an almost positive certainty of adhesions between uterus and abdominal wall, which carries with it more or less annoying late symp-

17. Kroenig, B.: Doederlein und Kroenig, Operative Gynakologie, 1912, Ed. 2.

toms and may be a source of danger in future pregnancies; copious bleeding during the operation; escape of amniotic fluid and meconium into the peritoneal cavity during the section and possibly leakage of wound fluid later on due to the contractions of the uterus.

Some of these obvious drawbacks also accompany the "high" cesarean section of Davis, for the profuse bleeding and the escape of amniotic fluid is common to both types.

The chief claim of the high incision is the prevention of adhesions and while such prevention seems plausible enough from a theoretical point of view, actual experience points the other way. Only recently Studdiford[18] demonstrated a uterus with extensive adhesions due to a high cesarean section, and a number of similar observations were recorded by speakers in the discussion following. It is this occurrence of adhesions which makes or mars the result of any abdominal operation. Only he who has had such adhesions himself or has tried in vain to cure them in others will fully appreciate the importance of prophylaxis. Indeed, it seems to me that at present the prevention of adhesions is at once the most important and difficult problem that confronts the abdominal surgeon.

For this reason alone, if for no other, the extraperitoneal cesarean section, and particularly the special technic employed and described in my three cases, recommends itself in preference to either the classical or the high cesarean section. Postoperative adhesions are inconceivable after the extraperitoneal method. The temporary protection of the abdominal cavity by whipping the parietal peritoneum onto the uterus prevents the escape of even the smallest amount of amniotic fluid which eventually might irritate the serous surfaces and give rise to adhesions.

After the operation the bladder peritoneum completely covers the field of operation, and even the three or four sutures which fasten the vesical to the uterine peritoneum disappear altogether from view owing to the continued contractions of the uterus. Thus an unbroken peritoneal surface is left behind, which can neither adhere to the parietal peritoneum (provided the latter has also been closed with proper precautions), nor can it lead to intestinal adhesions.

The afebrile course of the recovery and the perfect well-being of my patients at present still further corroborate this statement.

Other advantages of the extraperitoneal cesarean section are equally obvious. The description of the *modus operandi* may perhaps sound complicated; the actual operation is the reverse. There is a simplicity about it which must needs appeal to the surgical mind. Accustomed as we are to the abundant bleeding during the classical or high cesarean section, the almost total absence of bleeding from the incision in the lower uterine segment is striking. Nor is there any bleeding from the stitch holes around the denuded area.

We know, as a general principle, that any wound in order to unite firmly must be put at rest, but this desideratum is not feasible in the classical or high cesarean section, because the incision has been made through the contractile part of the uterine muscle, which continues contracting for days; whereas in the lower uterine segment such periodical disturbance of firm union does not obtain. These physiologic conditions not only render an exact adaptation of the cut edges in extraperitoneal cesarean section easier than in either of the other two methods, but they also safeguard against the possibility that wound secretions may be squeezed out into the peritoneal cavity.

On the other hand, does not this very thinness of the wall and comparative lack of contractile muscle fibers favor rupture of the scar during a future pregnancy or delivery? This objection which, theoretically, seems well founded, has deterred me for years from adopting the extraperitoneal cesarean section. Practical experience, however, has not supported such anticipation. Nicholson, in his thorough study of the literature, concludes that, "in so far as we may judge by the statistics at present available, there is at least no marked tendency to rupture of the old scar or other difficulties in future pregnancies."

The scar after extraperitoneal cesarean section is practically identical with that of a vaginal cesarean section and we know that the latter does not predispose to rupture. Within the last year I had occasion to deliver two women on whom I had performed vaginal cesarean section some years previously. Both deliveries were normal, exceptionally rapid, and without any cervical lacerations. Similar observations have been made by others.

That injuries of the bladder or traumatism to the vesical plexuses can be easily enough avoided, appears from the description. As a matter of fact, I am not aware that any such complications have been recorded.

There is no need to fear that the pelvic connective tissue will become infected if only the operation itself has been strictly aseptic. Neither need we feel concerned lest the available space prove too small for our manipulations and the incision tear further during the extraction of the child. Such an objection is largely theoretical if we remember that the incision through the lower uterine segment measures about 5 inches.

There is only one condition in which the extraperitoneal does not offer advantages over the intraperitoneal method, and that is in the placenta praevia. Here an incision through the lower uterine segment would open the enormously dilated blood sinuses, the inundation with blood would render orientation difficult, the lack of contractile fibers militate against prompt checking of hemorrhage, and the friability of the tissues favor tearing and prevent accurate adaptation.

With this single exception, the extraperitoneal method not only possesses all the advantages of the ordinary cesarean section and its modifications, but so far as our present experience goes, surpasses it in safety and freedom from postoperative complications.

It seems strange, therefore, that the newer method has found but scant recognition in this country. For aside from my three cases, there has been reported in all but eighteen others—one operated on by Kelly,[12] another by Druskin[19] and sixteen by Hirst.[20] This last author, who employs a method similar to that used in my cases, expresses himself enthusiastically and gives the extraperitoneal method preference in the majority of instances.

A few more cases were put on record in the discussion on Hirst's paper just referred to. Growing familiarity with the technic will no doubt remove quickly the bars which in the past have prevented the general adoption of extraperitoneal cesarean section.

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18. Studdiford, W. E.: Am. Jour. Obst., 1914, lxix, 480.

19. Druskin: THE JOURNAL A. M. A., May 2, 1914, p. 1383; Med. Rec., New York, 1914, lxxxv, 978.

20. Hirst, B. C.: Bull. Lying-In Hosp., New York, June, 1914.

VARIOUS TYPES OF LUES

A CLINICAL AND LABORATORY STUDY. THE ABELIN REACTION. DIRECT SUBDURAL INJECTIONS*

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The clinical history of syphilis, admittedly one of the most protean of all diseases, is in the process of being rewritten, and when the chapters are relatively complete it will be found that we are indebted rather to the laboratory worker than either the internist or neurologist for our more complete knowledge. It was at one time supposed that syphilis of the nervous system was a late manifestation of the disease, and this statement is generally true from the clinical point of view. Precocious syphilis was the term employed by Gowers for those cases in which patients manifest organic nervous phenomena within a year from the appearance of the primary lesion. For many years it has been recognized as a possibility, and cases have been reported by Gowers, Fournier, Oppenheim, Nonne and others, including an instance furnished by Gregory and Karpas of a case of cerebral syphilis occurring six months after the development of the primary lesion.

In going over some of the patients and records in the hospital at the naval home in Philadelphia, with Dr. Stokes, formerly surgeon-general of the U. S. Navy, I was struck with the greater virulence of the disease in general and the serious and occasionally early involvement of the nervous system occurring in sailors who had contracted the disease in the Orient. It is solely from the clinical point of view, however, that we of to-day are justified in regarding syphilis of the nervous system as among the later phases of the activity of the treponema. Soon after the use of salvarsan became general, considerable discussion arose as to the part it apparently played in causing involvement of various cranial nerves and other more or less pronounced nervous symptoms. Previously free, involvement became manifest within a few hours or days following an injection of the drug. Routine study of the cerebrospinal fluid from luetic patients revealed to Dreyfus that about 80 per cent. of late primary and early secondary cases show distinctive pathologic changes in the spinal fluid (cytologic increase or increase in protein content and more rarely a positive Wassermann). Thus, the explanation of the preceding, essentially a Herxheimer reaction, local or diffuse, depends on distribution of the treponemas, and is due to liberation of toxins resulting from the lytic action of salvarsan on the parasite.

This carries with it the thought, first, that all initial doses should be small, and secondly, if symptoms of involvement of the nervous system occur, it is not necessarily a contra-indication to the further use of the remedy, but rather the reverse, though in small doses. Even the few early cases which we have felt justified in submitting as illustrative, show well the pathologic changes in the spinal fluid and there is absolutely no doubt from the point of view of the serologist, that the vast majority of luetics, from the date of the primary infection, are essentially candidates for syphilis of the nervous system. Though they may not present a single symptom, the treponemas invade all parts of the body within a day or two at most from the time of infection. Neisser succeeded in inoculating animals with blood taken from monkeys five days after the original infection and with splenic pulp taken on the twelfth day. Hoffmann has shown that monkeys may be infected by using the blood from a human in the secondary stage, and that under such circumstances the incubation stage in the monkey is shortened. Infection successively passaged through a series of animals increases the virulence of the infection and shortens the incubation period. Flügel recovered the treponema from the blood of a woman with a secondary, maculopapular eruption. Indeed, it is probable that the eruption is in the nature of a parasitic embolism similar to the rose spots of typhoid fever, which are mycotic, congested, capillary loops. Veillon and Girard selected a typical maculopapule and excised it on the third day after it appeared. The capillaries were dilated and congested with an early, perivascular, lymphocytic infiltration, and treponemas were found, by the silver method, in and about the capillaries. Neisser, Buschke, Levaditi, Tomasczewski, Noguchi and others have found the parasite in tertiary lesions of the skin and various organs including the nervous tissue, either by direct staining methods or by inoculation into animals. Von Zeissl found records of more than 150 cases of facial paralysis, deafness or retinitis occurring within one year of the period of original infection. Thus it is evident that every stage of the disease is potentially infective; the possibility of transmission, however, becoming less in direct proportion to the elapsed time since the original infection.

Two points in connection with the primary infec-lesion, the knowledge that syphilis may be contract d without the development of a chancre, and the well-known evanescence of secondaries in some cases, should render us tolerant in our judgment of those from whom no history is obtainable. Jonathan Hutchinson has reported several cases, one in a nurse and several in physicians, in whom the disease followed a punctured wound, the first evidences of actual infection being adenopathy and eruption. This possibility has since been confirmed experimentally. A chancre is only possible when cutaneous or mucous membrane infection occurs. Again, we sometimes see a patient in whom a chancre has developed, often atypical, to be sure, who admits exposure months or even a longer period in the past, but who denies recent infection. Keogh, in 1911, called attention to the fact that, in relapses occurring even at long periods after salvarsan has been given, whether the Wassermann be positive or negative at the time of the relapse, the clinical picture is more or less a replica of the condition presented at the time the patient first sought treatment. Thus, if treatment is given in the primary stage, a relapse is often manifested as a chancre, secondary stage—secondaries. Keogh regards this as a true latency, unlike the apparent latency of cases treated with mercury, which, as a rule, assume a far more advanced type in the relapse.

Briefly, then, the present concept of syphilis is that, in its earlier stages, it is a septicemia with more or less involvement of the nervous structures and coverings from the beginning. In the course of time, for some unknown reason, special predilection is manifested for

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* Because of lack of space this article is abbreviated in THE JOURNAL. The complete article appears in the Transactions of the section and in the authors' reprints. A copy of the latter will be sent by the authors on receipt of a stamped addresed envelope.

some particular organ or tissue, after a period of apparent latency which only serologic study will reveal. In some instances, indeed, the latency is so well concealed that only a provocative Wassermann, as first suggested by Gennerich and almost simultaneously by Milian, will reveal it. This test is practically a Herxheimer reaction and proves the presence of treponemas somewhere in the body, hence their lysis and the subsequent successful application of serologic diagnosis. Recognizing the comparative frequency of early involvement of the central nervous system, as shown by the serologist, it would seem advisable to make studies not alone of the serum, but also, in every case of lues or suspected lues, to make routine examination of the spinal fluid, and to control treatment by subsequent studies, and, finally, to determine a cure by provocative injections governed by complete laboratory observations. It is not too much to claim that such a plan would in all probability prevent the development of the more destructive forms at present so common among us.

As to types of lues, it is only possible to speak in very general terms. Except for the rare cases in which a chancre fails to develop and those in which secondaries are fleeting or suppressed, the most constant and fairly uniform stage is the septicemic or secondary period. Beyond this we may speak of pernicious anemic or other blood dyscrasias, of cardiovascular, visceral, osseous, ulcerative cutaneous, central nervous (including special sense-organs) and congenital types, but each of these groups presents many varieties. Serologically, we are also unable to speak of definite types. We believe, however, that when a standard technic is developed, especially with reference to the Wassermann reaction, and particularly when we reach a conclusion as to the proper antigen to use, less criticism will be leveled against its diagnostic value than is unfortunately the case at present. Even under existing conditions, the chief critics are those who possess no laboratory experience. Until such time it might be of value, in reporting laboratory results, to mention the antigen employed and the particular form of complement-deviation test used in the work, and especially the former. Using an alcoholic antigen prepared from fetal syphilitic liver, a sheep hemolytic system and the method as given by Citron, only varying the complementary strength to obtain relative quantitative results instead of using the continental method of a definite 0.1 c.c. of guinea-pig's serum, it will be found that the large majority of late primary cases, and all untreated secondary cases will give a positive serum, and very rarely a secondary will give a positive Wassermann in the spinal fluid. The majority of secondary cases will also show some other spinal fluid change, as increase in protein content or an increase in cell-count, with prompt reduction of Fehling's solution. Latent cases occasionally give negative Wassermann in serum and fluid, with a positive Wassermann in the serum as the rule, though they may give changes in the protein content of the fluid; but in these cases a reaction may be invariably provoked. The majority of non-latent tertiary cases give positive serums and more marked pleocytosis or protein increase and occasionally a positive spinal fluid Wassermann. Of the nervous forms, tabes is the most frequent. A very small number is serologically negative, but these are rare. The majority have a positive serum, a positive Wassermann in spinal fluid, a moderate pleocytosis and a more or less marked Nonne and less often a positive Noguchi. Since we have used spinal fluid in amounts of 0.5, 1.0 and 1.5 c.c., we have rarely had negative Wassermanns. In the cases clinically marked by severe pain, the cell-count is usually higher, and other evidence of inflammation of the root-zones and meninges is shown by marked Nonne or Ross-Jones and Noguchi reactions. A large proportion of this type also gives a positive Wassermann in the spinal fluid. When strong positive Wassermann is obtained in both serum and spinal fluid, in most instances there is a more or less pronounced pleocytosis up to 50 or 60 possibly per cubic millimeter, with protein increase and often a positive Lange (gold solution). These are the least amenable to treatment and are spoken of as Wassermann-fast types, though not by any means invariably so.

The unilateral type of tabes and those cases presenting but one or two symptoms, as pupillary rigidity and Westphal's symptom, present no special serologic type differing from any of the above. There is one clinical phenomenon of great value diagnostically, which occurs in the vast majority of tabetics and one which is not sought for routinely, but which furnishes strong collateral proof of the existence of tabes often at a time when very few criteria are manifest. We refer to that which Collier Martin has termed the tabetic sphincter. Digital examination of the rectum reveals external sphincter paresis. Firm lateral pressure is painless and results in more or less relaxation of the anus, permitting a good view of the lower part of the rectum. This relaxation may not be overcome for a period from a few seconds to some minutes.

The greater the degree of meningeal involvement the higher the cell-count and the greater the protein content. Hence, in cerebrospinal syphilis, the high count is found except in the purely endarteritic forms. In some of the cerebrospinal cases the serologic picture closely simulates that of paresis, except that it is far more amenable to treatment than is paresis. Hence a serologic diagnosis is of value not alone in a diagnostic sense, but also from the prognostic standpoint.

In general paresis the rule is to find a strongly positive Wassermann in both serum and spinal fluid, a moderate pleocytosis and a marked protein reaction. Until very late in the course of the disease, the serum is always positive, but in a small proportion of cases the spinal fluid Wassermann may be negative throughout. Paresis frequently falls under the Wassermann-fast group, and in most instances the Lange, gold solution, runs a parallel course with the Wassermann of the spinal fluid. These laboratory results and our failure to make satisfactory serologic or clinical impress on the types of lues involving the nervous system, when combined therapy by mouth and intravenously was employed, led us to take up subdural work. We had made attempts to recover phenolsulphonephthalein, methylene blue and formaldehyd from the spinal fluid but without success, after previous administration subcutaneously in the first, by mouth and subcutaneously in the second, and by mouth (hexamethylenamin) in the third instance, and we had never observed an icteric spinal fluid in any case of jaundice. We were, therefore, ready to accept the view that the best if not the only way to reach the nervous tissue is by direct methods. We found, too, that when we used a direct subdural injection of neosalvarsan without a previous intravenous injection, we were able to recover arsenic in the urine in a few hours, showing that absorption had certainly taken place. Tilney,

before the New York Neurological Association, reported some experimental evidence along these lines. He used trypan-blue, a vital stain, injecting 0.1 per cent. into cats and allowing them to live for twenty-four hours. At the expiration of that time, when a subdural injection had been given, the dura mater was intensely stained, the brain stained diffusely. The viscera were not stained. Microscopically he found the trabeculae of the pia extending into the brain and cord were stained, also the walls of the blood-vessels. The ganglion-cells and nerve-fibers were not stained. It seemed, therefore, that the dye found its way into the nervous tissue along the trabeculae and by the blood-vessels. Intra-arterial injection caused skin and visceral staining but none in the brain or cord or the meninges. Intravenous injection resulted in staining of the dura, pia and pituitary, though less than by intraspinal injections. Frozen sections showed the cord unstained. Subcutaneous injection resulted similarly to the arterial, the nervous tissues were unstained, but the viscera were stained.

Sicard employed ink by the lumbar subdural route in animals. In from two to four hours he found particles in the cerebellar region and still later in the region of the peduncles and within the ventricles. In from twelve to fourteen hours he found them also in the cortex of the cerebrum. He observed also that substances in solution in the cerebral fluid were removed by osmosis while particulate substances were removed by leukocytic phagocytosis. In spinal anesthesia it is well known that, if the dose be large and the specific gravity of the injected fluid be low, within a brief period, often a matter of a few minutes, both respiratory disturbance and vomiting will occur. We know also that the subdural fluid and that of the ventricles communicate normally through the foramen of Magendie at the apex of the fourth ventricle and through the foramina of Luschka at the outer margins of this same ventricle. Both on anatomic grounds, therefore, and on the basis of experimental evidence we are justified in our belief that better results must ensue in early cases of syphilis of the nervous system if subdural treatment is resorted to; and as many of the cases also have more or less cutaneous, visceral or osseous lues, the combined intravenous and subdural routes seem to be indicated in those whose infection during the earlier period has not been studied and treated in sufficient detail to prevent the more serious manifestations from arising.

To arrive at the approximate dosage of neosalvarsan given subdurally when 12 c.c. of a 40 per cent. solution are employed after an intravenous injection of 0.9 gm., we took the figures of Bischoff, who found the total volume of blood in the bodies of two executed criminals to be 7.1 per cent. and 7.7 per cent. respectively. Thus, to a patient weighing 150 pounds, each cubic centimeter of serum would contain about 0.00017 mg., and 12 c.c. about 0.002 mg. We then employed the Abelin reaction to determine the presence of arsenic in serum and urine. Using dilutions of known strength we obtained the following figures:

1:100	Beautiful red contact ring
1:10000	Reddish ring
1:20000	Brownish ring
1:30000	Brownish ring
1:40000	Brownish ring
1:50000	Very faint brownish ring
1:60000	Negative

We were unable to obtain a reaction in the serum of blood removed in ninety minutes, in any patient treated intravenously, and we have found a negative in one case and weakly positive in another at the end of sixty minutes. In the urine we were unable to recover it after ten hours. After intramuscular injections we did not examine the serum, but in the urine we obtained the reaction in thirty-one and forty-eight hours respectively. Abelin found practically the same results, though in two patients of his series treated intravenously, he obtained the reaction in the urine in seventeen and twenty-two hours. We found the reaction positive in the serum in from ten to fifteen minutes after the intravenous injection was given. The early disappearance of the Abelin reaction led us to take the blood in from thirty to forty-five minutes after the intravenous injection was completed. We have treated nine cases in all, two by the Swift and Ellis alone, two by the direct method alone, and five by combined Swift and Ellis and direct methods. Despite the experience of Wechselmann and Marinesco and more recently the experimental evidence of Swift and Ellis, we determined to try the effect of direct injections without previous intravenous. The maximum dose employed was 0.02 gm. of neosalvarsan, and the minimum 0.006 mg.

In all dosage we found the direct method too irritating. After a total of 11 direct injections, we found that the three paretics suffered the least, two of them having to be catheterized, one during the first twenty-four hours, one only at the end of the third day, and the paretic who had received 0.02 c. gm. and 0.01 c. gm. at different times, had no symptoms at all. Of the cases of taboparesis and tabes, all the direct injections were followed by severe pain, causing retention necessitating the use of the catheter for as much as two weeks and obstinate constipation. The direct injections were given in salt solution to one patient only, while in the others we employed the patients' inactivated serum in salt solution, a 40 per cent. dilution. It is well known that irritative phenomena occur after the Swift and Ellis method, so that if, as Ravaut claims, hypertonic salt solution robs the direct injection of the irritating effects of neosalvarsan, it might be well to use hypertonic salt solution as a basis for the dilution in the method of Swift and Ellis. One very advanced case of taboparesis, No. 28 of our series, was treated by the method of Swift and Ellis and by the direct method at various times. The patient finally died. Grossly, a little congestion of the meninges was found at necropsy, but sections studied by W. G. Spiller failed to show definite evidence of irritation. One case of paresis treated by both the direct and indirect methods, No. 34, shows marked improvement after failure to make any impress by seven intravenous injections given at weekly intervals and a number of injections of sodium cacodylate in 15 grain doses. The other two paretics are *in statu quo*. Two of the tabetics have shown marked improvement clinically, Nos. 26 and 27. They have received but two Swift and Ellis injections each. On the other hand, we have had two cases of tabes not included in our series, one with absent knee-jerks and lightning pains, the other with pupillary rigidity, absent knee-jerks, vomiting without pain, paresthesia and tabetic sphincter, both of whom recovered under intravenous treatment and mercury and iodids by mouth. The former, less marked, made an absolute recovery clinically and serologically, the latter has become subjectively symptom-free, knee-jerks now being present by reinforcement, vomiting, paresthesia and lightning pains totally relieved, the pupillary rigidity uninfluenced, serum

now negative, but spinal fluid has not as yet been examined. These cases prove our previous statement that if recognized early, and this includes careful clinical and serologic study, tabes may prove amenable to intravenous injections together with mercury and iodids by mouth. In later cases, the value of the Swift and Ellis and direct methods are still *sub judice*.

ABSTRACT OF DISCUSSION

DR. EDWARD L. TUOHY, Duluth, Minn.: Did Dr. Robertson find, in his experience, any marked evidences of difference in the various forms of this disease? It is said that in the Orient syphilis is more severe than in civilized countries. It is also said that it is more prone to attack the central nervous system. There happens to be a tremendous amount of discussion regarding the many heart-lesions that occur in lues and I would ask why this is. In tuberculosis we realize that when once an individual is tuberculous he is always tuberculous. It is shown that tuberculosis originates, as a rule, in childhood and such an individual will remain tuberculous thirty or forty years after inoculation. The same thing applies to lues; when once inoculated the individual remains syphilitic throughout his life. Regardless of all treatment the spirochete remains in the tissues until the end of the man's life. In the course of time, for some unknown cause, special predilection is manifested for some particular organ or tissue, after a period of apparent latency. In some instances this latency is so well concealed that only a Wassermann test will reveal it. The spirochetes lodge here and there in the body and the central nervous system is frequently involved. Often the "hit and miss" treatment may do good, but, on the other hand, may do harm by upsetting the immunizing processes that the body has developed.

DR. B. F. DISEROAD, Philadelphia: Will Dr. Robertson explain the following condition and state if in his experience he has made the same observation? We find a number of individuals with syphilis of long standing who give a history of chancre twenty or twenty-five years previously. This is followed by a long period of latency with the individual apparently enjoying good health, when suddenly manifestations of the disease crop out, either as tubercle syphilids, gumma of the internal organs and superficial structures, or of the central nervous system. Why then do these tertiary lesions following this latency occur singly in one of these various locations? All of these patients not treated for syphilis developed symptoms indicating lesions in cord or central nervous system. Some years ago I treated an elderly person who gave a history of recent trauma, but no history of any initial lesion. In the limb injured a gumma developed, but a clinical diagnosis was not made until symptoms of a lesion of the central nervous system cropped out, which was proved by a 4-plus Wassermann. Salvarsan caused an arrest of symptoms and the gumma promptly disappeared.

DR. A. J. CAFFREY, Milwaukee, Wis.: I think Dr. Robertson is wise in bringing out the point concerning the elimination of the primary chancre in syphilis. I know of a surgeon in Milwaukee who punctured his index finger while circumcising a primary chancre. No chancre appeared as a result but the secondary symptoms of syphilis appeared after a few weeks. He went on to an advanced paresis from which he died. Evidently this was a case in which the man became infected at the time of the circumcision without the appearance of a chancre. Dr. Lorenz of the state insane asylum at Madison, Wis., reported some success in the treatment of these cases, at a meeting of the Wisconsin State Medical Society. He gave neosalvarsan in minute doses—not by the Swift and Ellis method but by direct intradural injections.

DR. J. V. KLAUDER, Philadelphia: In a study of the cerebrospinal fluid from syphilitic patients, in a series of cases greater in number than those given by Dr. Robertson, the following results were obtained. Our list of cases does not include any of primary syphilis. In 70 per cent. of patients with secondary syphilis, we obtained some evidence of an abnormality of the cerebrospinal fluid. Ravaut gives 67 per cent.; Dreyfus 80 per cent. In our series of tabetic cases we obtained a positive Wassermann in the serum in 62 per cent. of the cases. Swift and Ellis and Hauftmann both report 66 per cent. The Wassermann in the spinal fluid in the same series was positive in 82 per cent. of our cases, and Swift and Ellis report 87 per cent. The spinal fluid in all of our tabetic cases showed some evidence of an abnormality, except one, a clear-cut case, in which the spinal fluid was normal. In the same series, about one-half either denied infection or had mild secondaries. Attention has already been called to this, especially by Mott. Many of the tabetics gave a history of what was no doubt mixed infection; I believe this occurrence of mixed infection is more common than is usually accepted. The published reports of the intraspinal treatment of tabes and paresis are somewhat contradictory. The literature on this subject is rather confusing. Many do not countenance subdural injections of any character in the treatment of lues. In the Swift and Ellis treatment the dose of salvarsan or neosalvarsan contained in the serum is indefinite and variable. In the direct intraspinal treatment Ravaut advocates the injection of a rather large amount of salvarsan in a hypertonic salt solution, as much as 12 mg. Marked symptoms of irritation following this plan of treatment have been reported. We have injected 20 mg. of neosalvarsan intraspinally, which was followed by marked symptoms of irritation, in some cases. We do not believe that the efficiency of the treatment depends on the large dose injected. Ogilvie advocates the direct intraspinal injection of neosalvarsan in small amounts not exceeding 1 mg. No definite plan of direct intraspinal treatment has yet been formulated. The Swift and Ellis technic is a matter still *sub judice*. We believe that the most accurate plan so far as dosage is concerned, is first, to remove some of the patient's serum, following this by an intravenous injection of the dosage decided on, and, finally, to introduce into the inactivated serum a definite amount of neosalvarsan not exceeding 5 mg., which should be given subdurally. This method also possesses the advantage of saving considerable time, and permits the treatment of several cases in the time usually allotted for one Swift and Ellis treatment.

DR. W. W. TOMPKINS, Charleston, W. Va.: What observations have been made in treating cases of syphilis of benign character as found in the negro? Of the negroes in my community many are intemperate, ignorant, suspicious, and will not carry out any directions given them in the way of treatment. If they come with a chancre one can do practically nothing after making the diagnosis. When the secondaries appear it is difficult to make them out because of the color. There is one point of interest, however, with regard to the occurrence of syphilis in the negro. I have observed that certain glands become enlarged, but the patients go on from year to year and do not suffer from the disease. So far as the late symptoms of the disease are concerned, such as locomotor ataxia and paresis, they are the rarest things in the world among the negroes. The glands that become infected are the cervical; they enlarge and after awhile they suppurate, then heal, leaving scar-tissue with more or less deformity. The surprising thing about these cases is that, with little or no treatment and in a class of patients that are often underfed and overstimulated, the symptoms should be so mild and free from serious complications or sequelae.

DR. W. E. ROBERTSON, Philadelphia: I have had little experience with lues in the colored race, so that I am unable to state whether or not grave lesions are common among negroes. In a few instances I have seen optic atrophy, tabes and other evidence of profound involvement of the nervous system in the negro, and such cases I believe are fairly frequent in the wards of the Philadelphia General Hospital. Concerning the modern treatment of luetic infections, we feel forced to utter a note of warning. The rapidity with which primary and secondary lesions disappear after an initial intravenous injection gives a false sense of security

to the patient and increases the moral obligation of the physician. Unless he makes clear the necessity for careful laboratory studies, both for diagnostic purposes and as a guide to treatment, there will probably be many more tertiary and paraluetic (so-called) wrecks than confront him now, as a result of the mercury and iodid plan of treatment. Consistently treated, both intravenously and with mercury in some form, it is probable that every patient would make a complete recovery; neglected it is still problematic how large a proportion can be saved by subdural therapy. We feel certain that no one in whom sequential exudation and inflammation has occurred can hope for much from any form of treatment. We also believe that when subdural treatment is practiced the dose injected should not exceed 5 mg. and as the dosage under the Swift and Ellis plan must be speculative, it would seem better first to remove the patient's serum, separate and inactivate it, then prepare the intravenous injection, removing an amount not exceeding 5 mg., which should then be injected in the subdural space after diluting it in the previously inactivated serum. The rest of the salvarsan solution should then be given intravenously.

OSTEOPLASTIC SURGERY OF THE FACE*

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ALTERATIONS OF THE FACIAL CONTOUR BY THE IMPLANTATION OF FAT

The modifications that the facial contour undergoes in the adult are dependent chiefly on alterations in the amount of subcutaneous fat. In the operative modification of the facial contour no substance is as well adapted for the purpose as adipose tissue. Bits of free homoplastic fat when properly imbedded subcutaneously find ready attachment, do not provoke serious inflammatory reaction and retain, after vascularization, their storage capacity for hydrocarbons. Transplanted fat may under conditions of increased nutrition undergo a certain amount of hyperplasia, and may waste during starvation. The transplanted fat when vascularized remains fixed in position and, unlike paraffin, when imbedded under the skin shows little change in outline, does not produce hyperemia of the overlying skin or marked fibroconnective tissue formation. In 1907 I[1] reported several operations in which free transplants of fat were used to isolate nerve trunks that had been subjected to operation. Recently Binnie[2] has reviewed the literature and has indicated many operative procedures in which free transplants of fat are of value.

My attention was first directed to the advantage of fat transplantation for the correction of facial deformity by a patient who had suffered extensive necrosis of both cheeks following the injection of paraffin by one of the most widely advertised "beauty doctors." The disfigurement was so great that the patient had been a recluse for six years. After excision of the scar tissue and the formation of cutaneous flaps, the depression remaining on the one side was so noticeable that finally a flap of fat was dissected subcutaneously from over the malar bone and turned down and imbedded, giving a satisfactory cosmetic effect. Later a patient presented himself with a marked facial asymmetry from lack of development of the lower jaw, particularly on the left side, following an ankylosis of twenty-four years' duration. After a bilateral arthroplasty a segment of one of his costal cartilages was implanted in the chin, and finally through an incision placed underneath the edge of the mandible, a subcutaneous pocket was formed and the sunken left side of the face contoured with bits of fat taken from the subcutaneous tissue of the patient's abdominal wall.

The implantation of the fat is useful after the removal of tumors or the liberation or resection of scars which leave secondary unsightly depressions. Fat may be also implanted for bony disfigurements, as after impacted fractures of the malar or frontal bones. After disfiguring operations, as on the frontal sinuses, and for certain congenital or acquired deformities such as receding chin, asymmetry of the maxillary bones and the like, the implantation of fat is useful. For the subcutaneous imbedding of fat the cutaneous incision need not be large, and should, if possible, be placed at some inconspicuous point as along a normal wrinkle line or beneath the jaw. The subcutaneous tissues are separated by a knife or by tunneling with blunt-pointed scissors. After arresting hemorrhage, bits of fat of sufficient size to correct the deformity are introduced and held in the pocket, which obviously must be of proper size and situation, by subcutaneous sutures of fine catgut. We have usually found it undesirable to suture the fat in position, as this prevents the adjustment of the imbedded fat to the containing cavity. The fat may be introduced in the form of small portions or strips and the subcutaneous closure should be sufficiently tight to prevent any extrusion of the fat from the limiting pocket. The skin is finally approximated by an intracuticular or very fine epidermic suture. Fat may be obtained from the adjacent subcutaneous tissue or from the abdominal wall. We have, thus far, not employed fat from another person. Although we have used larger quantities of fat in the restoration of the contour of the breast after the removal of benign tumors than are usually required in facial surgery, we have had no suppuration or evidence of absorption of the imbedded tissues.

THE CORRECTION OF SADDLE-NOSE

In certain cases in which the bridge of the nose has been lost without destruction of the tip or alae, a satisfactory bridge can be formed of metal, cartilage or bone. We have employed portions of a rib, costal cartilage, and tibia, the last method presenting certain advantages. An incision about 1 inch long is made from the base of the nose upward in one of the wrinkle lines of the forehead and is carried to the bone. With blunt-pointed scissors or a separator carried close to the nasal bones, the soft tissues over the bridge of the nose are thoroughly separated and elevated. A tibial transplant is removed, cut to appropriate shape, and after arrest of oozing is slid into position from the frontal incision, its ends respectively abutting against the frontal bone, and the cartilage just a short distance above the tip of the nose. If necessary two or more short strips of bone may be superimposed. The deep tissues are closed with fine catgut and the skin by a subcuticular or delicate epidermal sutures. The operation has the advantage of simplicity, slight disfigurement, of a location of the incision in an area susceptible to sterilization. Local anesthesia suffices. In one instance, after paraffin had

* Read before the Section on Stomatology at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

1. Babcock, W. Wayne: Nerve Dissociation, Ann. Surg., November, 1907.
2. Binnie: Surg., Gynec. and Obst., February, 1914.

failed to maintain its position, we split the tip of the nose just above the nares and imbedded a section of costal cartilage with excellent immediate effect, but infection and extrusion of the fragment followed.

THE CORRECTION OF SKULL DEFECTS

Silver plates placed under the scalp to cover defects in the skull present a large area of metallic surface that stimulates serous secretion. In a very limited experience we have found it necessary repeatedly to evacuate such secretion until finally infection has occurred and it has been necessary to remove the plate. In two instances we have remedied the defect in the skull by bridging with Lane plates which were so bent as to conform to the contour of the skull and were firmly fastened to the bone by screws. In the first instance the large flap of bone which had been separated fell to the floor during the operation and, of course, was not replaced. The patient was relieved of Jacksonian epilepsy but a large depressed area remained in the parietal region, which, as he bent forward, filled and caused so much vertigo that the man could not work. The disfigurement and symptoms were relieved by the use of the Lane plates, the thickened dura being lifted and fastened to the steel bars by interrupted sutures. In a second patient, a luetic woman, a disfiguring defect in the frontoparietal region was first partially corrected by a silver filigree. The silver filigree caused no irritaiton but was so soft as to become depressed and we later removed it and substituted Lane plates with the satisfactory cosmetic result.

IMPROVISED METHOD OF CORRECTING DEFECTS OF THE MANDIBLE

Modified Lane plates fastened to the bones by screws may be used in an emergency to take the place of absent portions of mandible. In one of our patients a large part of the left side of the face including the ramus and part of the body of the lower jaw was blown away by the charge from a shotgun. After operations to overcome the ankylosis and to restore the lining and covering of the cheeks, one arm of a three-pronged Lane plate was broken off and the plate fastened to the body of the jaw so as to form a new angle and a new ramus. Despite the attenuated and densely cicatricial tissue in which this flap was imbedded, it was worn with great improvement for over six months, being finally removed because the sharp rough angle of the plate penetrated the skin and produced a slight sinus without, however, much irritation.

RHINOPLASTY

In the Italian method of rhinoplasty in its original or one of its modified forms, it is usually desirable to swing a pedunculated supraorbital flap down on the nose leaving a defect in the lower part of the forehead that must close by granulation or skin grafting. We have found it of advantage in such a case, after removing the flap, to make a second incision close to the hair line, and, after mobilizing the tissues of the upper frontal region, push them down and accurately fill in the gap above the eyebrow. In this way little disfigurement remains in the lower part of the forehead and the granulating cicatrix is left close to the hair line where it may be covered by a hat or by a suitable dressing of the hair.

ENLARGEMENT OF THE EXTERNAL NARES

Much attention has been given to obstruction in the upper air-passages, and the influence of such obstruction, whether in the nose or pharynx, on the shape of the mouth and the development of the bones of the lower part of the face, requires no further emphasis. Apparently, however, little attention has been paid to obstruction due to the small size of the external nares. Fortunately, by resection of the skin and thin cartilaginous walls above the nasal openings, small and round nasal openings may be converted into fair-sized keyhole apertures. With a very sharp knife, wedge-shaped incisions are made. Great accuracy in planning the incisions is necessary to produce satisfactory symmetry of the two openings, and if the surgeon has not considerable dexterity it may be better to enlarge each opening by a punch to ensure uniformity.

The wound edges, after the wedge-shaped excision, are accurately united by fine horsehair sutures and permitted to heal without an external dressing under a scab. The stitches should be removed on the second or third day, by which time primary union will usually have occurred. By this method it is possible to increase the nasal aperture a third or more and to give the patient a corresponding relief from his external nasal obstruction.

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ABSTRACT OF DISCUSSION

DR. M. I. SCHAMBERG, New York: I am particularly interested in Dr. Babcock's method of transplanting fat from one portion of the body to another, and it sounds like a decided step in advance. The only question raised in my mind was whether or not that fat would in time be resorbed. I would be glad if Dr. Babcock would outline the behavior of this fat and the length of time that it will remain after the operation. I wonder whether he has had such an experience in using steel screws as I have had, in that they become badly rusted owing to the amount of oxygen in the tissues and the amount of moisture we find there. I do not believe much in Lane plates. I have not had recourse to the Lane plates but have had a case in which I was operating for marked prognathism, in which I took out a section of the jaw on both sides and brought the jaw back and held it in place by steel plates, which I removed subsequently. They were badly rusted and I believe were a source of irritation. I imagine the Lane plates retained only for a short time would do no harm. The results in this particular case of marked prognathism, however, have been as ideal as any I have seen. In another case a man who had been operated on in another department of the Post Graduate School of Medicine had lost his entire nose, save a little tip which flapped up and down and in which the opening afforded a full view of the nasal chamber and the accessory sinuses. In this case we are desirous of doing a cosmetic operation. Dr. Mitchell has devised a plan to restore the bridge between the nose and the mouth, and we are going to make a frame-work to be attached to a plate in his mouth and to run up into the nasal chamber. It will be cleansed through the mouth. The top of this appliance will be held in position, and the plastic work done over this frame-work. The skin can be folded over from the forehead, and I think we can give the patient a fairly good contour over the nasal chamber. The cleansing can be done by irrigation through the nostrils, or by the removal of this plate in his mouth, which will be supported by several teeth. We shall endeavor not to have any pressure on the bony structure above so that there will not be any resorption in this region. In another case a good portion of the jaw was removed from immediately above the angle to the bicuspid angle, and the remaining parts were held in place by silver plates riveted directly to the bone. This case resulted beautifully from a mechanical point of view. The patient immediately after

the operation was able to open and close the jaw, and to masticate with absolute articulation, but six months later the bone to which the silver plates were anchored necrosed and we had to remove the plates. I am not much in favor of permanent metallic attachments to bone as it interferes with the filling in of the tissue.

DR. H. S. DUNNING, New York: Will Dr. Babcock state how the Lane plates are held in when a greater part of the bone is carried away—whether they are attached to the end of the bone or to the soft tissues?

DR. WAYNE W. BABCOCK, Philadelphia: Many of these things have been alluded to in a fragmentary way and of course require working out. As to the permanence of the irritation in tissues produced by the Lane plate, I think it is largely a matter of infection. With a clean Lane plate imbedded or fastened to the bone, and without infection, I have seen no marked corrosion. Some of these I have seen in place for a number of years in connection with long bones. In one case the plates remained for three years and caused no irritation. Some of these plates were fastened with silver screws, and some with a steel alloy screw which is supposed to be non-tarnishing, though it does tarnish. I think if we have an opening and access to outside air, trouble usually ensues from this oxidation. That is the particular trouble in operating about the jaw; it is so hard to put these plates in the jaw without some communication from the outside, and that means, usually, that sooner or later the plate has to be removed. In one case we screwed the fixed Lane plate to a portion of the bone proper. It was fastened by two screws in front and fixed firmly and at rest in the tissues. In that case if the plate had been smoother I believe it would have been retained, because when the plate was finally removed there was no marked corrosion. As to the resorption of fat, for about twelve years we have been transplanting skin with the subcutaneous tissue to other parts of the body and we notice that as the tissue improves in nutrition, the fat with the subcutaneous layer becomes larger, so much so that at times it gets in the way. Apparently as the general tissue improves, tissue taken from the abdomen and put on the hand or arm will increase also. In a number of cases we have found it necessary to cut away fat which had so increased in size, and in the tissue removed the vascularity was perfect. I have under my care now a case of transplantation of fat which shows every evidence of softness of the tissue and the maintenance of the contour and vascularity. It seems that the storage capacity of the fat for carbohydrates has been transferred with the growth and is still being maintained.

Fig. 2 (Dog 84).—Infection following cut valve and stripped ureter; typical of Series 3.

Experimental Research and Medical Progress.—It may be taken as an axiom of medical science that everything of value in medicine and surgery has arisen from the applications of experimental research. Nor can future advance be made by any other method than the research method. It is true that accident may teach occasionally, as it did, for example, in the dreadful burns unwittingly inflicted on themselves and patients by the early experimenters in Roentgen-ray therapy and diagnosis. But accident is only the most blundering type of experimentation, and results obtained by its chance agency do not really invalidate the universal law that man only learns by experience, or, in other words, by research. Research is, after all, only the acquisition of fresh experience by the trained expert, usually led on to his experiment by inductance from other known facts.—Benjamin Moore, *Medical Journal of Australia.*

RENAL INFECTION

A FURTHER EXPERIMENTAL STUDY OF ITS RELATION TO IMPAIRED URETERIC FUNCTION *

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Injuries, inflammation, neoplasms, and congenital defects of the ureter, urinary bladder, or associated organs could be more often successfully treated had we an effectual method of entero-ureteral transplantation. It is pointed out by Watson and Cunningham[1] after condemning all operations for diverting urine, with the single exception of Maydl's, that "the very large proportion of cases have proven fatal either as a result of the operation or because of the renal lesions which are produced later by ascending infection from the intestinal tract."

Eisendrath[2] holds that "reimplantation of the ureter into the lower bowel is impracticable on account of the irritant action of the urine on the mucous membrane, causing persistent diarrhea, and on account of the frequent occurrence of ascending infection." Carl Beck[3] adds "infection of the kidneys secondary to the operation and the difficult control of urination" as "principal drawbacks." In addition to ascending infection, colitis, difficult control of urination, shock, peritonitis following technical errors, may be mentioned to explain the general failure of entero-ureteroplasty. Maydl's block transplantation seems to have met with most success, since, as Cunningham[1] puts it, "ascending infection is less probable . . . because of the protection afforded by the preservation of the natural relations." It has been our object in this paper to study these "natural relations," define them, and estimate their respective values. It was hoped to gain information on which to found a more satisfactory technic for an entero-ureteral operation. Evidently it must be based on inductive knowledge of the obscure physiology of the ureter. Given the normal gross anatomic relations of kidney, ureter, and bladder intact, it is taught that renal infection may be urogenous.[4] Cases of probable ascending infection are reported clinically.[5] Individual opinion as to the occurrence or non-occurrence of "ascending infection" seems to be as diverse as the proven clinical cases are rare.

* Read before the Section on Genito-Urinary Diseases at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

* Because of lack of space this article is abbreviated in THE JOURNAL. The complete article appears in the Transactions of the Section and in the authors' reprints.

1. Watson and Cunningham: Diseases and Surgery of the Genito Urinary System, Chapter on Entero-Ureteral Anastomosis; Genito Urinary Diseases, ii.
2. Eisendrath: THE JOURNAL A. M. A., Nov. 8, 1913, p. 1694.
3. Beck, Carl: Implantation of Ureter into Large Bowel, THE JOURNAL A. M. A., Nov. 8, 1913, p. 1691.
4. Blake, J. A.: Lectures Before Class in Surgery, 1910-11.
5. Le Brigand, Henri: Contribution à l'etude de la pyélonéphrite pendant la grossesse, Paris Thèses, 1899-1900.

ESSENTIAL STATE OF BLADDER FOR ASCENDING INFECTION

Guyon and Albarran[6] pointed out that bacteriuria and retention were necessary for kidney infection. Guyon[7] emphasized bladder sensibility and abnormal contractility with coincident cystitis. Courtade and Guyon[8] emphasized retention. Brewer[9] reviewed the work of these and other investigators and concluded the essentials to be (1) chronic cystitis; (2) acute retention with spasmodic contraction of the detrusor; (3) mechanical interference with ureteral sphincter. In our experiments we have not attempted to increase whatever retention may physiologically exist in dogs, although we realize that it may be important in the production of renal infection.

Fig. 5 (Dog 83).—Pyelonephritis following stripping ureter and cutting valve; cut surface (left) showing foci at cephalad pole.

MECHANISM OF ASCENSION

It was held by Guyon[7] in 1890 that cystitis may give rise to ascending nephritis. It is interesting to compare the findings of G. G. Smith's[10] analysis of ninety-eight cases of cystitis from the wards and the outpatient department of the Massachusetts General Hospital in which he pointed out that certainly not more than five had given rise to pyelitis by the ascending route, and that even this small number was doubtful. Renal infection from cystitis has been proved possible by different experimenters since, but the mechanism of its production is far from agreed on.

Obviously, given a suppurating bladder, infection may ascend to the kidney outside the ureter through the ureter wall or through the lumen of the ureter. If it travels outside, it may follow the course demonstrated by Samson[11] and designated vesico-utero-ovario-renal anastomosis, and follow these blood vessels; or by the lymphatics, as demonstrated by Stewart[12] in eight out of ten transplanted dogs' ureters. The infection may ascend within the ureter wall apparently only under a pathologic condition of the ureter itself, such as shown by Samson's[11] clinical case of purulent cystitis, ureteritis with exudative swelling and occlusion of the ureter and suppurative nephritis. If the infection ascends by the lumen of the ureter, several courses have been held by different investigators. It does not seem necessary to mention the method suggested by Kelly and repeated by Samson[11] of aspiration with air through the ureter during cystoscopy with the patient in the knee-chest position. Motility of the micro-organism is the means suggested by Guyon and Albarran,[6] on the basis of the difference in time of ascent between an inert colored particle and the colon bacillus; the ratio being roughly 2:1. If the organism is a coccus and therefore immotile, it is thought to ascend partly by the processes of reproduction and extension along the ureteral wall, and partly by a to-and-fro motion of the ureter itself. Orth and Jacobelli supported Guyon and Albarran. Le Brigand[5] in 1900 concluded similarly from his clinical observations. This to-and-fro movement is qualified still further as "countercurrent" and "eddy" by Adjevoli.[11] C. J. Bond[13] experimenting with insoluble dyes described a mucous current in a partially collapsed ureter. Anastalsis and reflux complete the means of possible intra-ureteral ascension. Reflux has been described as occurring in rabbits by Lewin and Goldsmith, Courtade and Guyon,[8] Jacobelli, and Marcus.[11] Jacobelli maintains that the fluid must be injected suddenly[14] into the bladder for it to ascend the rabbit's ureter. Courtade and Guyon observed reflux in dogs. Marcus further showed reflux of urine in rabbits possible by anastalsis or vesical contraction when the ureters were distended. Disse[11] explained the patency of the ureteral valves under such circumstances by contraction of the longitudinal musculature of the ureter, thus converting it into an inflexible

Fig. 7 (Dog 100).—Hydronephrosis following stripping of ureter.

6. Guyon, F., and Albarran, J.: Physiologie pathologique des rétention rénales, Tr. Assn. Franç. d'urol., 1897 and 1898, ii, 11; Anatomie et physiologie pathologiques de la rétention d'urine, Arch. de méd. expér. et d'anat. path., 1890.

7. Guyon: Cystalgies symptomatiques de lésions rénales et pyonephroses consécutives à des lésions vesicals; influence de traitement de la vessie sur le urétéro-pyélites, Ann. de gynéc. et d'obst., 1890, xxxiv, 81.

8. Courtade, D., and Guyon, J. F.: Sur le reflux du contenu vésical dans les uretèrs, Compt. rend. Soc. de biol., 1894, x, Series 1, p. 556.

9. Brewer: The Present State of Our Knowledge of Acute Renal Affections, with a Report of Some Animal Experiments, THE JOURNAL A. M. A., July 15, 1911, p. 179.

10. Smith, G. G.: Chronic Cystitis in Women Not a Disease, THE JOURNAL A. M. A., Dec. 6, 1913.

11. Samson: Ascending Renal Infection, with Special Reference to the Reflux of Urine from the Bladder into the Ureter as an Etiological Factor in Its Causation and Maintenance, Bull. Johns Hopkins Hosp., December, 1903, p. 334.

12. Stewart, E. F.: A Study of Ascending Infection of the Kidney Carried Out by the Method of Transplanting the Ureter into the Intestines, Univ. Penn. Med. Bull., 1911, p. 233.

13. Bond, C. J.: Ascending Currents in Mucous Canals and Gland Ducts and Their Influence on Infection: A Study in Surgical Pathology, Med. Rec., New York, Aug. 12, 1905.

14. Brewer's reference in THE JOURNAL A. M. A., July 15, 1911, p. 179: Sudden injection may temporarily paralyze the ureter.

tube. On the other hand, Young[15] in several cases failed to get reflux in dog's ureter after injecting the bladder with colored solution. This agrees with the findings of Draper and Braasch.[16] Samson[11] tried out anastalsis and reflux in nineteen dogs. To each bladder was attached a normal ureter, a ureteral stump, and the reimplanted cut distal end. In no case having normal valve or with valve absent did he observe reversed ureteral current. But he held reflux possible in conjunction with diseased ureter. May it not be that the

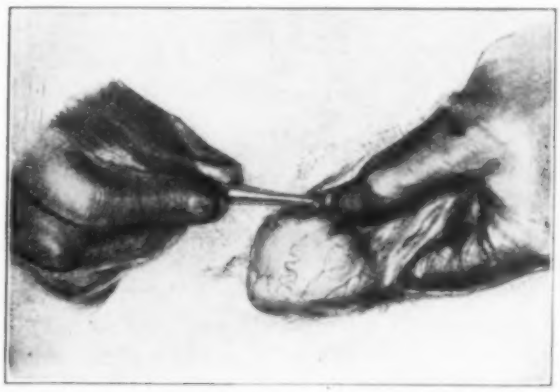

Fig. 10.—Technic of isolating and stripping ureter and irritating suppositional ureteral nerve plexus.

amount of injury to the ureter explains the varying results of these different investigators? We have distended the dog's bladder by a 4½-foot water column and noted no reflux in normal ureter with normal valve or in stripped ureter with normal valve. Suddenly injected fluid as observed by Jacobelli was noticed by us to collect slowly and drop from the cut end of stripped ureter with cut valve.

EMBRYOLOGY

It is known[17] that at the fourth week, the ureteric part of the kidney is apparent as a dilatation at the caudad end of the wolffian duct, near the cloaca; the nephritic tissue being represented in the sacral region. At the beginning of the second month the ureteric bud grows out against the nephritic tissue in the sacral region. By the end of the second month the renal bud has ascended to the lower part of the lumbar region, passing dorsad to the wolffian body; the ureter and its pelvic calyces can now be recognized. When we consider mammalian embryology and the close relationship of birds with their permanent cloacal arrangement to the mammals, there appears a phylogenetic as well as an ontogenetic basis for believing that the human body should be capable of assuming vicariously the recently lost function of storing urine. Furthermore, Huntington[18] calls attention to the origin of the bladder from the cloacal or intestinal space and to the relationship as shown in one of our larger American lizards, *Igriana tuberculata*, between the adult reptile and certain stages in the development of the mammals respecting the common termination of the genito-urinary and intestinal tracts.

15. Young, H. H.: Hydraulic Pressure in Genito-Urinary Practice, Especially in Contracture of the Bladder, Bull. Johns Hopkins Hosp., May, 1898, p. 100.
16. Draper, J. W., and Braasch, W. F.: The Function of the Ureterovesical Valve, THE JOURNAL A. M. A., Jan. 4, 1913, p. 20.
17. Bailey: Text-Book of Histology, p. 208.
18. Huntington: Genetic Interpretation of Some Variations of Genito-Urinary Tract, Harvey Lectures, Series 2, 1906.

ANATOMY

Anatomically the ureter is of course well understood. The vesical end is reinforced by a fibrous sheath which envelops the ureterovesical junction. The ureteral musculature is replaced as it reaches the vesical submucosa by longitudinal fibers arising from the bladder and paralleling the ureter within the bladder wall. The ureteral mucosa blends with that of the bladder, forming the orifice of the ureterovesical valve. The ureter is enclosed throughout in peritoneum, beneath which it derives blood, lymph and nerve supply. The blood supply has been mentioned. The lymphatics have been carefully worked out by Sakota. The nerves of the ureter are derived from the sympathetic.

PHYSIOLOGY

Physiologically much less is known. In speaking of the nerve control of the ureter Lucas[19] says:

> I believe that further research will justify the general division of the ureter into the following two portions: 1. The funnel-shaped portion cephalad to the isthmus contained in the renal pelvis and probably partaking of the nerve distribution of the kidney. 2. The straight portion extending from the isthmus to the bladder, which may be subdivided into (a) a cephalad third, containing nerve endings in its wall; (b) a middle third deficient in nerve endings, and (c) a caudad third, adjacent to the bladder and partaking to some extent in the nerve distribution of the bladder.

Von Bardeleben[20] holds that the renal plexus supplies the pelvis and the cephalad half of the abdominal part: the spermatic, the caudad half of the abdominal part; and the hypogastric, the pelvic portion. Ganglia and nerve ends he found in adventitia, large at the ends and small in the middle of the ureter. Piersol[21] and Cunningham support Bardeleben.

It is evident that the origin of muscular contractions of the ureter, whether neurogenic or myogenic is not understood, but that it is a matter of observation that rhythmical contractions do exist. They occur in

Fig. 12.—Technic of isolating and stripping ureter and irritating the suppositional ureteral nerve plexus.

peristaltic waves, which, beginning with the kidney pelvis, progress toward the bladder at average intervals of 9 seconds in the dog, according to our own observations. Urine appears to be forced into the bladder by each peristaltic contraction. These contractions appear to be quite persistent as long as the normal relations of the ureter are preserved, but vari-

19. Lucas: Physiological and Pharmacological Studies of the Ureter, Series 3, Am. Jour. Physiol., July 1, 1908.
20. Von Bardeleben: Handbuch der Anatomie des Menschen, vii, Part 1, p. 112.
21. Piersol: Human Anatomy, p. 1898; Normal Histology, p. 201.

able in force and frequency when these are disturbed. Moreover, this irregularity in ureteral peristalsis seems to vary in direct proportion to the degree of trauma to the organ. We believe that a complete removal of the ureter from its retroperitoneal bed affords a valuable technical index for the experimental study of renal lesions. It has evidently entered as an unobserved and uninterpreted complex into much of the clinical and experimental study reported to date without having been given due consideration as a causative factor. In brief, ureteral dislodgment causes a condition roughly analogous to so-called "adynamic ileus" of the gut.

EXPERIMENTAL PROCEDURE

We present for consideration the following proposition: Given a foreign body cystitis the local factors determining infection are:

1. The ureterovesical valves, and
2. The peristalsis of the ureter.

These factors may be made experimental variants as follows:

By 1. Cutting of the valve.
2. Disturbance of ureteral peristalsis.
3. Combination of 1 and 2.
4. Ureteral circumcision.
5. Combination of 2 and 4.
6. Combination of 1 and 4.
7. Combination of 1, 2 and 4.

These may be considered in detail as regards experimental findings.

Our experiments have been made on dogs, forty in all having been used exclusive of Draper-Braasch series. Each dog had received a maximum dose of morphin sulphate per kilo of body-weight, followed by profound ether anesthesia. Each case was subsequently nephrotomized, and an appropriate section preserved for a microscopical index of normal kidney.

TABLE 1.—EFFECT OF STRIPPING URETER AND CUTTING VALVE *

RENAL INFECTION

Case No.	Gross Findings	Microscopic Findings	Cause of Death	Days of Life
74	Normal	Normal	Hemoperitoneum	0
80	Congest.	Glom. congest.	Hemoperitoneum	2
72	Pyelonephritis	Sup. nephritis; abscesses; sup. ureteritis	Pyelonephritis	7
77	Pyelitis	Cong. parenchym. swelling	Pyelonephritis	3
73	Pyelonephritis	Sup. nephritis	Pyelonephritis	23
89	Congested kidney	Parenchym. degeneration; congestion	.....	20
88	Parenchym. degeneration	Perenchym. degeneration; hydropic degeneration; pronounced	Parenchym. degen.	11
83	Pyelonephritis	Sup. nephritis; abscesses; tubules distended with pus cells; glom. free	.....	13
81	Pyelitis; congested kidney	Glom. congest.	.....	18
84	Chr. nephritis	.....	Ether	121

* This and following tables represent work done at the Experimental Surgical Laboratory, New York University, 1913-14.

TABLE 3.—EFFECT OF CIRCUMCISING URETER

RENAL INFECTION

Dog No.	Gross Findings	Microscopic Findings	Cause of Death	Days of Life
110	Normal	Hemorrhagic kidney; congest. glomeruli	.....	5
112	.....	.....	Anesthetic	0
91	Normal	.....	Leakage	0
109	Normal	Normal; congest glomeruli	Peritonitis following perforation of bladder	12
117	Normal	Only one kidney was found at operation. Other kidney had been replaced by a parasitic cyst. Parasite was later identified as *Distophyme renal*	Leakage	60
106	Normal	Normal	Pneumonia	60
92	Normal	Normal or moderately congested	Shock	1½

TABLE 4.—EFFECT OF CIRCUMCISING AND STRIPPING OF URETER

RENAL INFECTION

Dog No.	Gross Findings	Microscopic Findings	Cause of Death	Days of Life
129	Pyonephrosis	Purulent nephritis	Pyonephrosis	29
*131	Hydronephrosis; hydro-ureter	Parenchym. degeneration very marked with conv. tubules crowded with granular casts; glomerular congest.	Hydronephrosis	6
68	Normal	Coagulated albuminous, exudate in Bowman's caps.	Leakage	2

* Colon bacillus was identified in both left and right kidneys. The presence of this organism in both kidneys was probably due to postmortem invasion.

TABLE 5.—EFFECT OF CIRCUMCISING URETER AND CUTTING VALVE

RENAL INFECTION

Dog No.	Gross Findings	Microscopic Findings	Cause of Death	Days of Life
*122	Hydronephrosis; hydro-ureter	Glomerular and intertubular congestion; cloudy swelling; parenchymatous degeneration.	Leakage	2
123	.....	.....	Anesthetic	0
113	Normal	Glomerular congest.; cloudy swelling	Infectious skin disease	50

* Ureter was found adherent to circularly incised wound of bladder 1 cm. distant from ureterovesical junction. This accounted for condition of kidney and ureter.

TABLE 2.—EFFECT OF STRIPPING URETER

RENAL INFECTION

Dog No.	Gross Findings	Microscopic Findings	Cause of Death	Condition of Ureter	Bacterial Findings	Days of Life
103	Hydronephrosis	Congestion	Intussusception	Patent	Coccus colon-like organism	7
70	Hydronephrosis	Dilated tubules	Hydronephrosis	Stenosed	Coccus colon-like organism	21
17	Hydronephrosis	Dilated tubules	Hydronephrosis	Patent	Coccus colon-like organism	.....
54	Hydronephrosis; hydro-ureter	Nephritis	Hydronephrosis	Patent	No change in fixation test for colon Culture omitted	25
69	Pyonephrosis	Purulent nephritis	Pyonephrosis	Stenosed	Coccus colon-like organism	29
21	Normal	Glomerular congestion	Perforation of bladder	Patent	No change in fixation test for colon	24
22	Parenchymatous	Parenchymatous	Peritonitis (technical)	Patent	No change in fixation test for colon	8
24	Interstitial nephritis	Productive nephritis	Pneumonia	Patent	Culture omitted	121
100	Hydronephrosis	Nephritis	Hydronephrosis	Stenosed	Culture omitted	69

TABLE 6.—EFFECT OF CIRCUMCISING AND STRIPPING URETER AND CUTTING VALVE

RENAL INFECTION

Dog No.	Gross Findings	Microscopic Findings	Cause of Death	Days of Life
*139	Normal	Congestion; bacteria in kidney	.....	3
*151	Normal	.....	Leakage	1
153	Normal	Normal	.....	13
152	Hydronephrosis following ureteral calculus Enlarged; lobulated; tense. Contained 80 c.c. clear fluid Paren.—shell Cal.—dilated Pus.—none	Typical hydronephrosis; compression and atrophy of tubules and glom.; moderate cellularity and plus conn. tissue	Euthanasia; great emaciation	57

* The streptococcus and colon bacillus were found in both kidneys of No. 139. Streptococcus was found in left kidney of No. 151. No bacteriologic examination of right kidney of No. 151 was made. The presence of these organisms appeared to be due to post-mortem invasion.

1. *Cutting of the Ureterovesical Valve.*—See Draper-Braasch series. A further technical point in valve cutting that seems worthy of note is that in attempting to cut the valve either do not traumatize the valve area at all, which ensures the natural color relations, or traumatize severely, which converts the valvular orifice into an ischemic ring.

Result (10 cases): No substantial kidney change.

2. *Disturbance of Ureteral Peristalsis.*—In nine cases the ureter was removed from its retroperitoneal bed, stripped of every recognizable vessel, nerve and fascial connection from kidney pelvis to bladder insertion. In order to make sure that it was absolutely freed from all nervovascular connections throughout its course, as well as to disturb the nerve plexus in the adventitia of the ureter, the ureter was rubbed snugly with dry gauze throughout. It was then allowed to drop back into the peritoneal cavity.

Fig. 14.—Technic of further step in circumcising ureter.

In each case of these series a cubical foreign body infected with autogenous colon bacilli and other organisms, and of such shape as not to cause valvular ureteral obstruction, as suggested by Draper and Braasch, was placed in the bladder through a mesoventrad incision so that, as subsequent examinations of urine and bladder revealed, a purulent cystitis was produced.

Result (9 cases):[22] Hydronephrosis in various stages.

3. *Combination of 1 and 2.*—Result (10 cases): Pyelonephritis may follow. But the lower segment of straight portion of the ureter is supplied by the sympathetic through the vesical plexus. To eliminate a possible nerve control through such recurrent fibers the following observations were made by

4. *Ureteral Circumcision.*—In circumcising the valve an incision was carried about the ureterovesical implantation through the serosa, muscularis and submucosa to the firm, comparatively resisting, vesical mucosa. When completed this incision was carefully closed by continuous suture.

Result (7 cases): No kidney change.

5. *Combination of 2 and 4.*—Result (3 cases): Hydronephrosis.

6. *Combination of 1 and 2.*—Result (3 cases): No kidney change.

7. *Combination of 1, 2 and 4.*—Result (4 cases): No kidney change.

Therefore the severing of whatever nerve supply enters the ureter from the bladder appears to play no essential part in the possible renal infection.

22. Barber, Stuart and Symmers: Hydronephrosis: An Experimental Study.

CONCLUSIONS

Given an infected bladder and making due allowance for systemic and local resistance:

1. The ureterovesical valves can be cut without resulting renal infection. Duration of life indefinite.

2. If the ureter is circumcised to but not through the vesical mucosa the kidney remains normal. Duration of life indefinite.

3. Ureteral traumatism resulting in greater or lesser degrees of impairment of function as indicated by prostaltic paralysis, resulted in 75 per cent. of cases in hydronephrosis which in the early stages were not infected: a mechanically changed kidney which might or might not be infected later. Average duration of life, 30.33 days.

4. If the valves were cut and the ureters were paralyzed, hydronephrosis did not occur, but the kidneys underwent a primary infective change in 50 per cent. of cases. Average duration of life, 13.57 days.

At the beginning of this paper it was stated that our object was to study, define and estimate the respective values of the "natural relations" of the ureter.

The integrity of the "factor of safety" which protects the kidneys both from urogenous infection and from hydropic degeneration appears to depend directly on the unimpaired prostalsis of the ureter; indirectly on the integrity of the ureterovesical valve and most interestingly on the relationship btween these physiologic and anatomic barriers.

The authors acknowledge the constructive criticism of Prof. George D. Stuart and Prof. Douglas Symmers; also the detailed assistance of Dr. A. G. Bennett and Dr. W. C. Noble of the department of bacteriology.

104 East Fortieth Street.

ABSTRACT OF DISCUSSION

DR. J. W. DRAPER, New York: I am glad to corroborate and endorse everything that Dr. Barber has said. The work is not yet finished. All these experimental studies seem never to come to an end. Nevertheless, I believe we are justified in saying that one may cut the valve without getting an infected kidney. Of course, all of these dogs operated on have been treated just as Dr. Braasch and I treated the first series, namely, in the bladder has been placed a cubical piece of coal which has been rubbed in the dog's own feces, thus securing an autogenous infection and a condition which is allied to, but probably not identical with human cystitis. Nevertheless, they pass a great deal of pus in the urine. Such a series will go on without any renal infection or general infection. If, however, in addition to cutting the valve, the ureter is deinnervated and devascularized by Dr. Barber's method, one is practically certain to get, or we have, in this last series, obtained quite constant results, namely, infection of the kidney. We are not prepared to say just how it occurs, but we are prepared to say that the kidney becomes infected. If, on the other hand, as Dr. Barber has said, the ureter is simply lifted from its bed, with an accompanying devascularization and deinnervation, except possibly for recurrent innervation that may come from the bladder—because we have not been able to cut through the entire mucosa without killing the dogs, and the circumcision which Dr. Barber has devised most ingeniously cuts off everything except that small vestigial remnant—one obtains an uninfected hydronephrosis, and one which differs somewhat from the transitory hydronephrosis which occurs after ligation or other mechanical obstruction of the ureter. Of course, we are not in a position to say positively that there is no mechanical obstruction to the ureter as a result of this

extensive handling. It is quite conceivable that there may be considerable swelling, enough swelling of the lining cells to make a transitory semimechanical obstruction; but we believe that it is due to the complete paralysis which we have shown to exist as a result of the procedure.

DR. W. F. BRAASCH, Rochester, Minn.: The experiments carried on by Dr. Barber explain, at least partially, certain factors in the physiology of the ureter with which we have not been acquainted heretofore. It is evident from his experiments that the action of the ureteral peristalsis is important in preventing ascending infection. These experiments should be of practical value in connection with operations on the ureter. The Maydl and Coffey operations which have proved to be the most successful, in which the ureter is implanted in the bladder-wall, are both made with the idea of preserving the so-called ureterovesical valve. The importance of this valve in the first series of experiments on the ureter made by Draper and Braasch was not appreciated. We inferred that the preservation of this valve was of no importance, but Dr. Barber has shown that it is important if the blood and nerve-supply of the ureter above is not preserved. So the important point is that, while with the Maydl and Coffey operation the blood and nerve-supply may be destroyed, the ureterovesical valve is preserved and infection does not occur. That dilatation and insufficiency of the ureterovesical orifice is not of much importance in preventing ascending infection, provided that the ureter above is normal, is proved by a number of cases of cystitis in which, on cystoscopic examination, the ureteral orifice was greatly dilated. The bladder-fluid could be seen entering the ureter and returning again with each respiration and the pyelogram showed the bladder ureter to be greatly dilated. The ureter above the bladder was quite normal and with the catheter high up in the ureter the urine came from the catheter with perfect peristalsis, showing that the lower ureter is not of much importance provided the ureter above is normal. Dr. Barber's experiments should clear the way for more successful reimplantation of the ureter, which is not infrequently necessary.

DR. JOHN H. CUNNINGHAM, JR., Boston: It has been fairly well established by many clinical observations and experimental studies that renal infection as an ascending infection by continuity from an infected bladder is rare, and when it does occur, is dependent on a disturbance of the normal function of the ureteral openings, associated with urinary retention and cystitis. With the preservation of the normal relations of the ureteral openings a protection to an extension of infection from the mucosa of the bladder up the ureter or the possibility of a reflux of infected urine must be discarded. Several years ago Dr. Garceau and I made a series of experiments bearing on this point. We injected a methylene-blue solution into the bladder of anesthetized dogs, varying the degree of pressure from a few pounds to that sufficient to rupture the bladder, and in no instance did the dye find its way up the ureter or even beyond the ureteral openings. This work has been repeated by Young, Draper and Braasch with the same results. On the other hand, with any disturbance of the normal condition of the ureteral openings, either congenital or acquired by changes in the musculature from long-standing retention of urine, ulcerations or new growths involving them, or ureteral calculi impacted near the terminal end of the ureter so that the ureteral mouth becomes patulous, renal disease may take place by an ascending infection. As has been stated, the essentials for ascending renal infections are a combination of factors, namely, an infected bladder, with an interference with the function of the ureteral sphincter. Whether or not the infection of the kidney may take place from an infected bladder by way of communicating lymphatics is chiefly speculative, although there is some experimental evidence that such is the case. This naturally brings us to ascending renal infection in those instances in which, by operative procedures, the normal relations of the ureteral openings are disturbed. All operative procedures except Maydl's, which removes the trigon with the ureteral openings undisturbed, destroy the muscular mechanism which prevents ascension from the bladder to the kidneys by way of the ureters, and the clinical observations show that the large proportion of such cases prove fatal as the result of the operation or because of the renal infection which occurs later by ascending infection. This includes the cases of ureteral implantation on the surface of the skin, in the vagina in the female, and in the intestinal canal. In fact, many instances in which Maydl's operation of implanting the trigon into the intestinal canal with the ureteral orifices undisturbed have resulted in ascending renal lesions. The theory of this operation is correct, yet it is difficult of performance, and it is not beyond a most likely probability that the ureteral mechanism is disturbed in its performance. It is for this reason that Dr. Watson and I have maintained that double nephrostomy is preferable to bilateral ureteral implantation by whatever method. I cannot agree with Dr. Barber that the implantation of the ureters into the intestinal canal has any sound foundation, because of the embryologic feature of their once having been a part of the common excretory apparatus, the cloaca. Nor do I believe that the phylogenetic relationship of birds and mammals is any sound argument that the human may, on an ontogenetic basis, assume that which is a phylogenetic fact, because ontogeny is simply a reflection of phylogeny, and ontogenetically there is a further specialization of tissue which renders the comparison of conditions from an ontogenetic and phylogenetic point of view entirely separate. With regard to the experimental features, Dr. Barber has once again proved that a disturbance of the sphincteric mechanism at the ureteral outlet into the bladder may result in renal lesions, and has emphasized that ureteral traumatism results in an impairment of ureteric function and produces kidney changes which frequently lead to subsequent infection of the impaired organs. He has shown that disturbance of the natural relations of the ureters proper and their valves lessens the value of the kidney and leads to subsequent infections. This important piece of experimental investigation corroborating the already established clinical facts strengthens my belief that, when it is necessary to dislodge the ureters permanently, bilateral nephrostomy is to be preferred to ureteral implantation by whatever method, because, by this method of diverting the urinary stream, renal infection of a serious character is less likely to take place. It is by just such pieces of experimental work along the lines of comparative pathology that we shall find the explanations of clinical observations and through them receive information helpful to our understanding of clinical facts.

DR. D. N. EISENDRATH, Chicago: I made quite a study of the lymphatics of the ureter, in connection with some recent experimental work. We know that there is a set of lymphatics in the mucous membrane passing in and forming a network around the epithelial cells of the ureter, and communicating with the lymphatics of the submucous layer, which again communicate with the lymphatics in the muscular and fibrous coverings. The interesting problem to me is that, in spite of the fact that Dr. Barber cut through all of the coats except the mucous membrane by his incision above the bladder, leaving only the mucous coat, he should have had such an ascending infection as he has shown. The old theory was that all of the infections traveled from the bladder to the kidney by reason of continuity in the mucous membrane. It looks as if his work were a substantiation of the old theory, whereas the new view is that infections go by means of the deeper lymphatics.

DR. W. H. BARBER, New York: There was no increased fixation for colon bacillus from the time the dogs were first operated on until a week had elapsed after operation and the organisms found on culture from the bladder, ureter or kidneys were the colon bacillus, the streptococcus, or both.

Answering Calumny.—If a man has reported to you, that a certain person speaks ill of you, do not make any defense to what has been told you; but reply, the man did not know the rest of my faults, for he would not have mentioned these only.—*The Encheiridion.*

NECROTIC BONE AND THE SUBSEQUENT CHANGES WHICH IT UNDERGOES *

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CHICAGO

Bone destruction may be molecular, to which the name of caries is applied, or *en masse,* when it is spoken of as necrosis. Caries is usually produced by the milder and slowly acting circumscribed affections in which bone destruction keeps pace with bone death. On the other hand, necrosis results from the more rapidly acting and severer processes in which a more or less extensive area becomes involved and destroyed in a comparatively short time and which persists for an indefinite period before removal. Before considering the special subject of necrotic bone and its subsequent changes it is well to glance briefly at the subject of tissue necrosis in general in order to determine the differences which obtain for bone, and the reasons for their occurrence.

Fig. 1.—Transplant 164 days old showing the dead cortex about one-half substituted by new bone.

The death of tissue *en masse* occurs either from infection or from circulatory disturbances which may be acute or chronic in nature. When due to an acute infection the necrotic tissue is usually rapidly broken down by the action of cytolytic agents and to a less extent of phagocytes, and with the other products of inflammation makes a purulent or ichorous accumulation. Such accumulations are either discharged from the body or are slowly absorbed. Necrosis in chronic inflammatory processes, as tuberculosis and syphilis, consists more in a death of the hyperplastic granulomatous tissues which have formed than of preexisting cells affected by the process. It results in the formation of caseous material, the fate of which may be any one of the following: liquefaction and discharge, absorption, encapsulation or calcification.

Necrotic tissue resulting from circulatory disturbances behaves differently according to the presence or absence of infection. If in such tissue an infection occurs, the destructive changes are accelerated, and combined with the inflammatory reaction, abscess or moist gangrene results. If no infection is present, as in the case of bland infarcts of the kidney and spleen, the necrotic tissue persists as a soft cheesy mass which is slowly replaced by an ingrowth of the surrounding connective tissue.

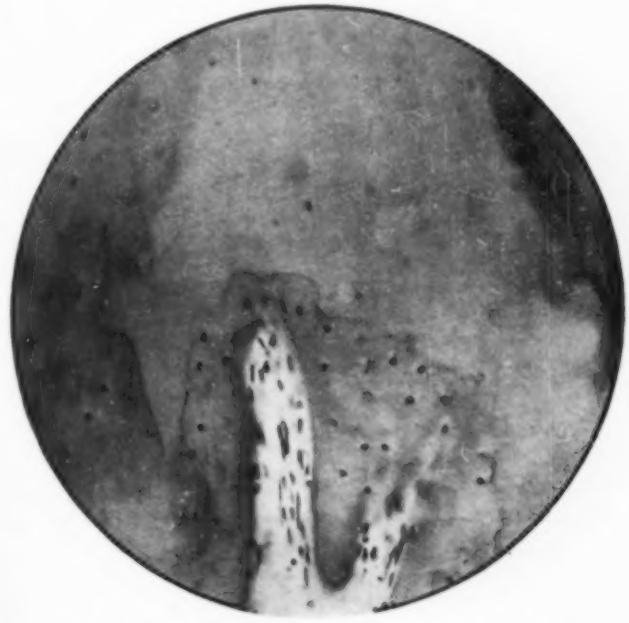

Fig. 2.—Same transplant as shown in Figure 1 under high power.

Fig. 3.—Transplant into soft parts, 199 days old, showing some absorption but no substitution by new bone.

If necrotic bone is studied according to this same classification, marked differences will be seen between its behavior and that of necrotic soft parts. These differences are observed chiefly in the manner of removal and in the substances which replace the

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* From the Surgical Clinic, Rush Medical College.

necrotic material. This is because of the calcareous nature of the bony stroma. The soft parts of the bone, that is, the bone-cells and the contents of the vascular canals and porous spaces, break down and are absorbed in the same way as necrotic soft parts in other portions of the body. The stroma, 60 per cent. of which consists of calcium salts, resists the ordinary rapidly acting lytic agents, persists for a long period and requires a special process for its removal. Comparatively little is known of the chemical process by which bone is absorbed, but according to Wells it varies directly in proportion to the carbon dioxid content of the surrounding media and cells. There has been a general misconception as to the nature of the osteoclasts or cells which produce the absorption. Most of them are ordinary fibroblasts and in the absorption of aseptic necrotic bone but few giant-cells are to be seen. In septic processes, however, large numbers of giant-cell osteoclasts are found.

Fig. 4.—Extensive osteomyelitis of humerus with marked involucrum formation and only a small sequestrum (s) at upper end.

Fig. 5.—Osteomyelitis of fibula showing involucrum and some rarefaction of old cortex.

Necrosis due to circulatory disturbances is best exemplified by bone transplants. When living bone is transplanted, the nutritional disturbances are so great that only the unossified peripheral portions, that is, the periosteum and medullary contents, and the more superficially located osseous cells, survive. The great bulk of the compact bone undergoes necrosis. The fate of the necrotic portion varies with the location of the transplant according to Roux's law of functional adaptation. If the transplant is placed in a bony defect where it has a function to perform it undergoes the following transformation: The surviving osteogenetic cells proliferate, revascularization of the haversian canals occurs, the old cortex is gradually absorbed and replaced by new bone. This is the so-called creeping substitution which was first pointed out by Barth. Figure 1 shows the transformation in a transplant at the end of 164 days. About one-half of the necrotic bone has been absorbed and replaced by new. Figure 2 is a high-power view of the same. If the transplant is placed into the soft parts where it has no function to perform, the surviving portions remain inactive, producing only a very small amount of new bone, no transformation of the transplant occurs, and the necrotic cortex is slowly absorbed by the surrounding connective tissue. This is illustrated in Figure 3, of a 199 days' old transplant.

In the transformation which goes on in aseptic transplants, deposition of new bone keeps pace with

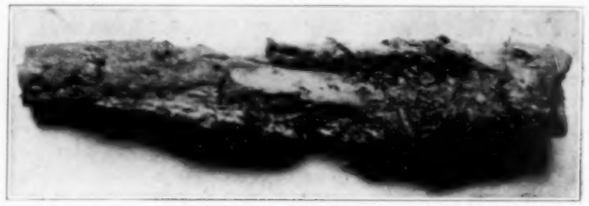

Fig. 6.—Excised shaft of fibula shown in Figure 5. Note involucrum and sequestrum.

old bone absorption, so that the newly formed bone is as dense as the original.

Necrotic bone due to infection undergoes a variety of changes according to the cause.

OSTEOMYELITIS

In osteomyelitis the inflammatory process invades the bony cortex resulting in exudation, thrombosis in its nutrient vessels, superficial accumulation of an exudate and necrosis of a varying amount of the shaft, depending on the severity of the process. The changes which the necrotic portion may undergo are variable. In the region where the inflammatory process is severest, the bone is so extensively damaged that it

Fig. 7.—Dead cortex in bone shown in Figure 6 away from sequestrum, undergoing absorption and substitution by spongy new bone.

becomes separated from the surrounding portions as a sequestrum. It may be cast off through a fistulous tract by the action of granulation tissue and an exudate; it may be encased by an involucrum and keep up a discharging sinus, or it may be gradually absorbed by the surrounding granulations. In case absorption occurs rather rapidly the place of the sequestrum may be filled

in by new bone, but if the process extends over a long period marked osteosclerosis of the walls occurs, the cavity does not fill in, and a chronic bone abscess results. This sclerotic condition of the walls preventing filling in of the cavity is the explanation of many fistulas which persist after sequestrotomy.

Necrotic bone in which inflammatory reaction is not so severe does not become separated as a sequestrum.

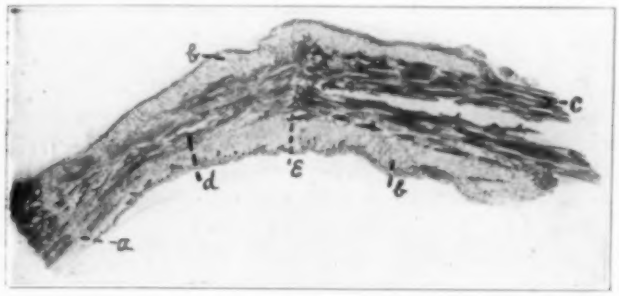

Fig. 8.—Infected transplant with healed fracture through middle portion: *a*, union between transplant and shaft; *b*, involucrum about transplant formed from its periosteum; *c*, sequestrum of upper end of transplant; *d*, dead cortex being absorbed; *e*, fracture in transplant.

The inflammatory signs in it gradually subside. Blood-vessels and granulations containing osteogenetic cells grow into the canals from the surrounding involucrum, absorb the necrotic portions and deposit some new bone, thereby transforming the necrotic into a living area. This transformation differs materially from that which occurs in aseptic transplants, in which as much new bone is deposited as old bone is absorbed. In the substitution of the quiescent necrotic portions in osteomyelitis, absorption is much more rapid and

Fig. 9.—Showing rapid absorption of dead cortex with some substitution by new bone.

extensive than new bone formation; consequently during the early stage the newly transformed portion is spongy in character. In some of the milder cases of osteomyelitis none of the necrotic bone is separated as a sequestrum, all of it being gradually invaded and replaced by new bone. This accounts for the fate of much necrotic bone which according to Roentgen findings is seen to exist, but which is not cast off as a sequestrum, or removed by operation. Figure 4 is of a suppurative osteomyelitis 3½ months old, with an extensive involucrum along the shaft suggesting considerable necrosis of the cortex. At operation only a small sequestrum was found at the upper end, after the removal of which the patient went on to recovery. No doubt the necrosis was more extensive than this and some of it underwent substitution.

Figure 5 is of a suppurative osteomyelitis of the lower end of the fibula 2½ months old. There is an extensive involucrum about the diaphysis, a sequestrum of the lateral portion of the cortex, and some rarefaction of cortex on the mesial side. The entire diaphysis including involucrum which was excised by the surgeon is shown in Figure 6. On longitudinal section the mesial side presented no sequestra, but microscopic examination shows a part of its cortex to be necrotic. Rapid absorption is occurring with the deposition of a much smaller quantity of new bone, the ultimate result of which would have been a renewed cortex of spongy bone. Figure 7 shows the

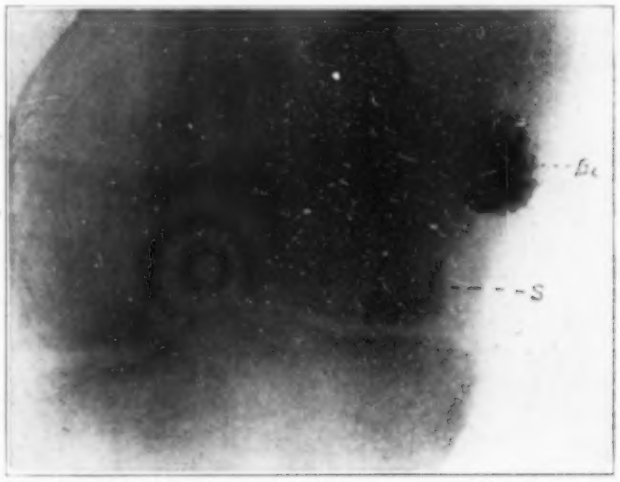

Fig. 10.—Calcified sequestrum casting heavy shadow in tuberculosis of knee. *S*, sequestrum. *Bi*, bismuth paste.

combination of dead bone absorption and new bone formation which is going on.

INFECTED TRANSPLANTS

Infection of a transplant may produce various results. If it is severe and involves the entire field of operation, death and sequestration of the entire transplant results, which necessitates its removal. However, if the infection is mild or confined to one end only, a very different condition results. The transplant in most of its length takes, but an osteomyelitis is set up in it, resulting in marked proliferation of the superficial cells which survived, the formation by these cells of an involucrum about the transplant, and rapid absorption of its compact bone, with some new bone formation, producing the type of transformation in the cortex already seen in the necrotic bone of osteomyelitis. In case one end of the transplant is severely infected, it may be separated as a sequestrum and require removal. Such a 75 days' old infected transplant into the ulna of a dog is shown in Figure 8. (There is marked infection and non-union at the upper end where a sequestrum 1.5 cm. had formed.) The rest of the transplant, which has a united fracture through its middle portion, shows osteomyelitic changes. There is an involucrum

about it, and marked absorption of the necrotic cortex is occurring with only a small amount of substitution, as shown in Figure 9. This shows that clinically a transplantation may be successful even in the presence of an infection.

TUBERCULOSIS

Most bone destruction in osseous tuberculosis is by caries, in which the dead tissue is absorbed as rapidly as it is formed. More or less extensive areas of necrosis develop either as a result of rapid tissue invasion and caseation in a severe process, or by the formation of a cone-shaped infarct from the plugging of the arterial supply to the involved region. Whether the vascular obstruction is due to embolism, as originally asserted by König, to obliterating endarteritis, or to the ingrowth and pressure of the tuberculous tissue is a disputed point. In any event the infarcted area becomes infected and its medullary space is filled with caseous material. It is separated into a sequestrum from the surrounding living bone by a zone of tuberculous granulation tissue.

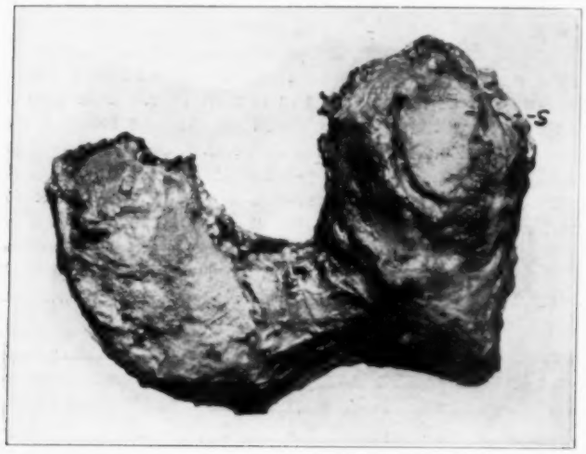

Fig. 11.—Excised condyles of bone shown in Figure 10. *S*, base of sequestrum.

The subsequent changes which such an area undergoes are variable and differ much from those occurring in necrotic bone in osteomyelitis. In some instances tuberculous granulation tissue invades the sequestrum and breaks it down into bone sand, which is either discharged or eventually absorbed, leaving a cavity in the end of the bone bordering on the articular surface or epiphyseal line and filled with granulations or with an exudate and which later is rarely filled out by new bone. In others the sequestrum may become encapsulated and remain undisturbed for months or years, although such an area is apt to contain a certain amount of tuberculous granulation tissue. A sequestrum of long standing casts a heavier shadow than the surrounding living bone. This is partly due to the fact that it is formed early in the disease when the bone possesses its normal density, and that subsequently as a result of the presence of the tuberculous infection and disuse, marked atrophy occurs in the surrounding living bone. Some of these sequestra, however, cast heavier shadows than the corresponding bone on the well side, and the normal arrangement of trabeculae is obscured. Cheyne states that this is due to early new bone formation in the involved area before necrosis sets in. Histologic examination reveals three specimens of which I have made an entirely different explanation. The sequestra contained about the normal amount of trabeculated dead bone, but there was more or less *extensive calcification* of the necrotic material filling the marrow spaces, which is the explanation of the increased density.

Figure 10 shows a cone-shaped area in the region of the external condyle of the femur casting a heavy shadow. Figure 11 is a photograph of the specimen removed by Dr. Dean Lewis at operation. Figure 12 shows a section passing through the markedly atrophic living bone, the zone of tuberculous granulation tissue and the dense sequestrum. Figure 13 is a photomicrograph of the sequestrum showing necrosis of both bone and articular cartilage, and marked calcification of the necrotic tissues filling the marrow spaces. Figure 14 shows the heel of a boy with tuberculosis of the right ankle of three years' standing. A large sequestrum is seen in the os calcis which on comparison casts a much heavier shadow than the well bone on the opposite side. Histologic examination of the removed portions showed extensive calcification in the marrow spaces.

This phenomenon has been noted by other observers, but extremely scanty mention is made of it in the literature on the pathology of bone tuberculosis. I am convinced from these histologic examinations and from a number of roentgenograms of tuberculous joints showing similar dense infarcts from which no tissues were removed that it is of not infrequent occurrence. I have not seen and find no record of calcification occurring in necrotic bone, the result of other diseases. The effect of calcification on the sequestrum, as in the calcification of other diseased foci, is to render it less harmful, so that it must be regarded as a reparative process. If the surround-

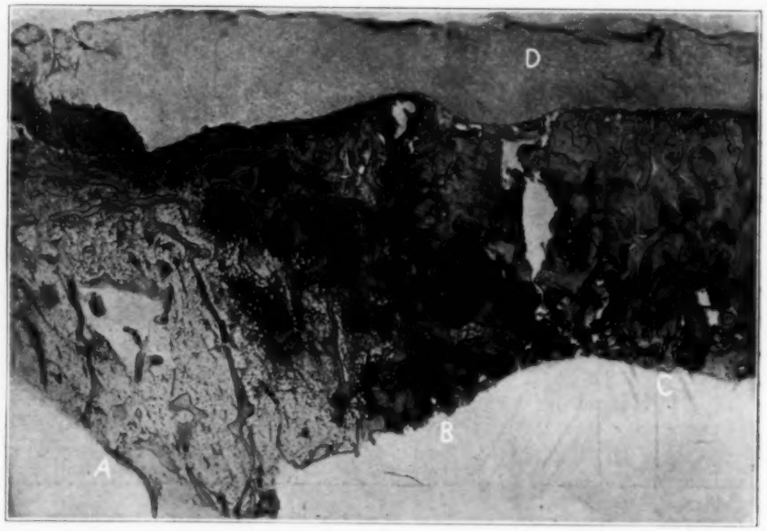

Fig. 12.—Section through living rarefied zone (*A*), tuberculous zone (*B*) and dense sequestrum (*C*), covered by necrotic articular cartilage (*D*).

ing zone of tuberculous granulation tissue should disappear, substitution of the sequestrum by the ingrowth of the surrounding bony tissue would be certain to occur, because the presence of calcium salts either in the shape of a calcified area or as dead bone favors the occurrence of ossification. Calcified areas in the soft parts as the lungs, kidneys, heart-valves, etc., usually undergo a certain amount of ossification by heteroplastic bone formation from the surrounding connective tissue. Whether such substitution of calcified tuberculous sequestra ever occurs has not been recorded, but it is rendered doubtful by the histologic examinations I have made. In all three cases a narrow but distinct zone of tuberculous granulations separated the sequestrum from the surrounding living bone, and as long as such tissue is present, substitution by new bone cannot occur.

From a pathologic point of view the surgical removal of such areas is as clearly indicated as the removal of sequestra in osteomyelitis, for destruction

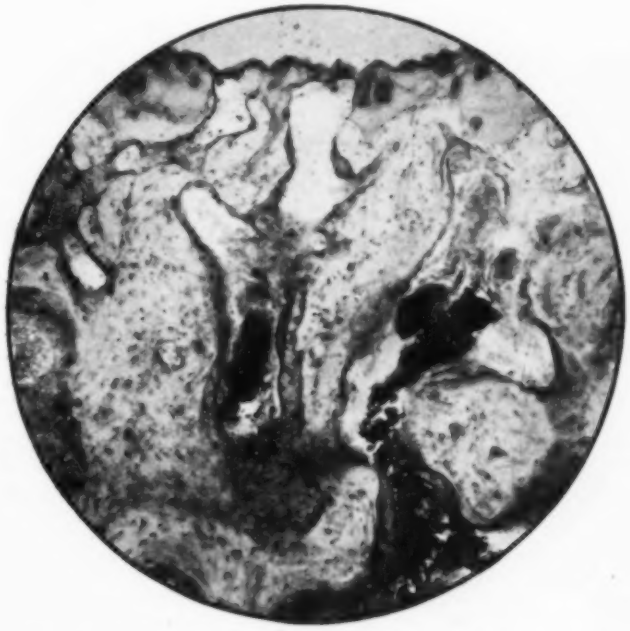

Fig. 13.—Sequestrum by high power, showing calcification in the marrow spaces.

by the surrounding granulations is much more difficult after calcification has occurred than before. Whether clinical results justify their removal is a disputed question with the operating surgeons on one side and the conservative orthopedists on the other.

SYPHILIS

In syphilis of the bones where the diaphysis is chiefly affected, caries plays an important part in the bone destruction, but the occurrence of irregular sized and shaped areas of necrosis is much more prevalent than in tuberculosis. They are due to the rapid development and irregular spreading of gummatous material with marked involvement of the blood-vessels and subsequent necrosis of the granulomatous tissue. New bone formation with sclerosis of the surrounding region occurs. Subsequent extension of the infectious process may result in death of the sclerotic portion, so that sequestra may be markedly eburnated.

The fate of the necrotic bone is variable. Much of it becomes separated as sequestra which are absorbed, leaving irregular areas filled with gummatous or necrotic material. When abscess formation and perforation occur, sequestra may be expelled, which is particularly the case with syphilis involving the bones of the vault of the skull. Substitution of the less severely involved necrotic portions may occur by the ingrowth of blood-vessels and osteoblasts from the

Fig. 14.—Tuberculosis of os calcis, with sequestrum, containing about normal number of trabeculae and calcification of the marrow spaces. Marked atrophy of the unaffected bones.

Fig. 15.—Necrotic bone (*A*) in syphilis, undergoing substitution by new bone (*B*).

surrounding living portions with the absorption of the old bone and deposition of new. Figure 15 shows this process occurring about the edge of a large syphilitic necrotic portion of the frontal bone in a man who died of gummatous meningitis.

In conclusion, necrotic bone may undergo a variety of changes—rapid absorption, sequestrum formation,

creeping substitution by new bone, or calcification —according to the nature and severity of the cause. Hence, as Axhausen has previously pointed out, the terms necrotic bone and sequestrum should not be used synonymously.

122 South Michigan Avenue.

ABSTRACT OF DISCUSSION

DR. FRED H. ALBEE, New York: Did the case of the sequestra in the knee shown by Dr. Phemister prove to be one of purely tuberculous infection, without any sepsis?

DR. CHARLES A. PARKER, Chicago: Dr. Phemister brought out a practical point with regard to the possibility of a necrosed bone's being taken care of by the system of the patient. I have seen a case in a child with necrosis of the left tibia and the right femur. Both showed the same appearance, with calcium deposits around, although no involucra. The tibia was removed because the leg still had the fibula for support. The femur was not removed. The patient did very well; and a roentgenogram showed a condition approaching normal a year later. The case was discussed at a medical meeting in Chicago at which many roentgenograms were shown. I asked the surgeons what was done to the femur, because they had strongly advocated removing the bone right away. They told me that the femur did not seem to do so badly as the tibia. The fact is that, in children, these cases may repair themselves, if given the opportunity.

DR. HENRY W. FRAUENTHAL, New York: Was the Wassermann test made in Dr. Phemister's last case or in the other two cases?

DR. D. B. PHEMISTER, Chicago: Answering Dr. Albee, there was no secondary infection in any of these cases with tuberculous infection and the formation of sequestra. If the sequestrum is surrounded by an active tuberculous process, it may break down and be removed. The tuberculous process about it may become quiescent and the sequestrum remain; and when that occurs, if calcification takes place in the sequestrum, I do not see why it could not remain forever, and not require removal. In my third case, however, in which calcification of the sequestrum occurred, there was a zone of tuberculous granulation tissue about the shadow. The process had not become quiescent. It acts as a foreign body, and when once calcified it is destroyed with more difficulty by the tuberculous granulation tissue than before. Therefore, its removal seems indicated. I cannot say whether the Wassermann test was made in all these cases or not. I am sure it was in the last; but about the other two, I am not positive.

Fig. 1.—Traumatic separation of the epiphysis with partial atrophy of the head (Case 1).

Bullets and Bacilli.—In the wars of the world they have been as Saul and David—the one slaying thousands, the other tens of thousands. I can never see a group of recruits marching to the depot without mentally asking what percentage of these fine fellows will die legitimate and honorable deaths from wounds, what percentage will perish miserably from neglect of ordinary sanitary precautions?—Sir William Osler, *British Medical Journal.*

COXA VARA ADOLESCENTIUM TRAUMATICA *

ARTHUR STEINDLER, M.D.
DES MOINES, IOWA

My remarks are to be confined to those cases of coxa vara of the adolescents in which a causative or contributary relation exists between trauma and deformity.

In a general way it is now conceded that separation of the upper epiphysis of the femur is likely to occur from trauma, either as partial or as complete separation or decollement of the epiphysis. For practical purposes, however, much of the information drawn from literature is too casuistic and dogmatic. On the other hand, considerable work has been done to establish definite facts in regard to practical questions of etiology and diagnosis. For instance, what is not only possible but likely to result from certain trauma to the hip in certain ages? What amount of violence is necessary to produce gross changes in the adolescent hip? What is the influence of chronic or repeated traumatism? And what is known of the relation hereto of static forces and rachitic predisposition?

Early investigations into the problem of adolescent coxa vara, beginning with the observations of Mueller, Hofmeister and many others are greatly governed by two points, late rickets and static forces. Concerning the latter, Helbing,[1] in a very exhaustive monograph on the subject, emphasizes the difficulty of distinguishing between the static and the traumatic coxa vara adolescentium, except for minute data in the history; but as I shall show later, especially the data bearing on the traumatic nature of the disease often fail to come forth in the history of the patient.

It is probably equally difficult to establish the relationship between trauma and late rickets. Among the endeavors which have been made to arrange the material from this point of view I may mention Peltesohn's[2] classifications:

1. Cases of traumatic coxa vara without rickets, which he thinks are rare. Nevertheless the literature abounds in instances of epiphyseal separation and following deformity in which no traces of rachitis could be found.

2. Cases of rachitis of the upper end of the femur with trauma as contributing cause of coxa vara. To

* Read before the Section on Orthopedic Surgery at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

1. Helbing, C.: Die Coxa vara, Ztschr. f. orthop. Chir., 1905, xv, No. 31.

2. Peltesohn, S.: Zur Aetiologie und Prognose der Coxa vara infantum, Ztschr. f. orthop. Chir., 1911, xxviii, 3, 4.

this group undoubtedly belongs a majority of cases of traumatic separation of the epiphysis.

3. Purely rachitic cases of coxa vara adolescentium without trauma, but as the writer himself hesitatingly remarks, it may be that in these cases, too, slight traumatism contributes to establish the deformity. It seems that more satisfaction is to be derived from the simple anatomic distinction of Froelich[3] and other

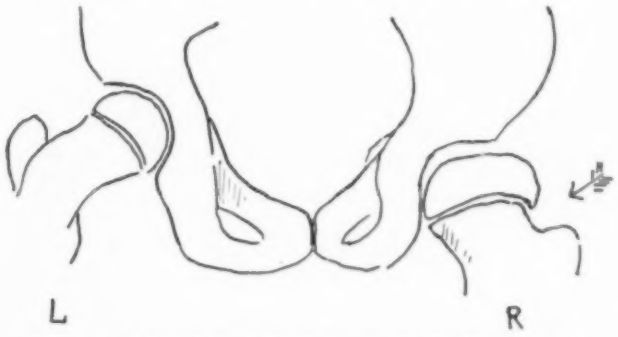

Fig. 2.—Epiphyseolysis following acute epiphysitis (Case 2).

French writers: coxa vara trochanterica, coxa vara cervicalis and coxa vara capitalis. They consider the depression and inflexion confined to the neck as rachitic, while the depression of the head alone on the neck in this age, the coxa vara capitalis, is traumatic, meaning epiphyseal separation or infraction. As Froelich terms it, coxa vara essentielle, from overweight or insufficiency of the epiphyseal cartilage. Kirmisson,[4] too, points out that the *decollements epiphysaires* in adolescents are clinically and radiologically established beyond doubt as following insignificant injuries and leading to coxa vara deformity. These observations are now rapidly being acknowledged and confirmed from many directions. They are by no means rare. In 1903 Hoffa[5] reported 53 of his own cases, besides the 10 of Royal Whitman,[6] all in all 88 cases in the literature of separation of the epiphysis. Lately Wolff[7] reported 34 cases and Gerstle 53 cases of the same nature.

Relative to predisposing rickets, the enlargement of the epiphyseal line and its softening as studied by Mueller, Kocher, Hofmeister, Frangenheim and a host of others indeed furnishes a favorable condition for slight and apparently insignificant injuries to loosen or to displace the head of the femur in the epiphyseal line. From Roentgen studies of such cases Siebs[8] arrives at the same conclusion, that most cases of coxa vara traumatica of the adolescents are primary separations of the epiphysis, at least as far as the coxa vara capitalis is concerned; that furthermore, if rachitic softening preexists it is manifest by the curving of the neck (coxa vara cervicalis) and it may represent a predisposing factor for following epiphyseal separation on slight trauma. While this combination is the rule, cases of purely rachitic deformity and cases of pure traumatic nature do exist, according to this observer.

On the other hand, the ambiguity of the relations of coxa vara adolescentium traumatica to statica is best illustrated by those cases in the literature classified as traumatica and following fall on the hip or other minor injuries (Rammstedt[9]). Sprengel[10] remarks that this epiphyseal displacement varies very widely in degree. The more incomplete forms approach more and more the so-called static form.

A gross displacement of the fragments necessitates a more extensive laceration of the periosteal covering. Cases occurring from major injuries show correspondingly more of periosteal tear. But the majority of cases occur from lesser injuries, as fall on the hip, etc., and in these cases the epiphysis may give as the point of lesser resistance while the periosteum still is complete. Microscopic examinations of the epiphysis after separation were carried out by Sprengel. Though unable to find any other bone pathology in his cases he noticed that the interfragmental substance consisted of true callus tissue. In the callus itself he found besides minute hemorrhages numerous very small particles of detached necrotic bone tissue and cartilage proving the traumatic nature, although no mention was made of a trauma in either of his two cases.

The Roentgen-ray evidence of the simple displacement offers no difficulty. But secondary changes may be noticed also consisting in atrophy of the femoral head and corresponding points of the acetabulum. R. Levy's[11] investigations show that osteo-arthritic changes may follow disturbances of the epiphyseal lines and that a coxa vara capitalis osteo-arthritica may be seen as a sequela of traumatic separation of the epiphysis.

Experimentally separation of the epiphysis has been obtained by Wullstein and Rammstedt. They were

Fig. 3.—Coxa vara traumatica from separation of the epiphysis (Case 9).

able to produce it by direct violence to the trochanter with the pelvis fixed and the thigh in extension and slight abduction. They conclude from their experi-

3. Froelich, A.: De la coxa vara, XXVme Cong. franç. de chir., Paris chirurg., 1912, iv, 834.
4. Kirmisson, E.: La coxa vara, XXVme Cong. franç. de chir. Paris chirurg., 1912, iv, 836.
5. Hoffa, A.: Ueber Schenkelhalsfrakturen im kindlichen und jugendlichen Alter, Ztschr. f. orthop. Chir., 1903, xi, No. 49.
6. Whitman, R.: Fractures of the Neck of the Femur, Ann. Surg., 1897.
7. Wolff, O.: Ueber traumatische Epiphysenlösungen, Deutsch. Ztschr. f. Chir., 1900, liv, No. 45, p. 273.
8. Siebs, E.: Beiträge zur Lehre der Schenkelhalsbrüche jugendlicher und kindlicher Personen und ihre Beziehungen zur Coxa vara, Fortschr. a. d. Geb. d. Roentgenstrahl., 1904, viii, 237.
9. Rammstedt, C.: Traumatische Lösungen der Femurkopf-epiphyse und ihre Folgen, Arch. f. klin. Chir., 1900, lxi, 559.
10. Sprengel, C.: Ueber die traumatische Lösung der Kopfepiphyse und ihr Verhalten zur Coxa vara, Arch. f. klin. Chir., 1898, lvii, 805.
11. Levy, Richard: Beitr. zur. Frage der Coxitis, Coxa Vara und Osteoarthritis juvenilis, Deutsch. Ztschr. f. Chir., 1911, xcv, 205.

ments that the femoral epiphysis, while quite firm and resistant, will under certain conditions yield to either total separation or partial loosening according to whether and to what extent the periosteal covering is being torn. The periosteum may hold the head in place even after separation, and this point is considered explanatory of the fact that the young patient after the injury does not lose the function of the limb, but is able to bear weight on it. Only step by step the loosened epiphysis yields under the body weight as the tears in the periosteum allow of the slanting of the head downward and backward.

With all this evidence brought out statistically, pathologically, radiologically and finally experimentally in favor of the existence of the epiphyseal separation and its relation to coxa vara adolescentium, it may seem that I am wasting too much time discussing undisputed facts. But the point is not so much to prove the condition as such, but rather its relative frequency. In other words, in a certain age, from say 9 to 16, if a certain traumatic factor, major or lesser, is given, epiphyseal separation is not only possible but highly probable to occur, with or without preexisting or coexisting rickets, and to be followed by a deformity known as coxa vara adolescentium. In fact, such was the case in eighty-four out of Hoffa's eighty-eight cases collected.

The second point is that the producing trauma may be and very often is so slight as to fail to impress the observer with its significant connection. Nevertheless, as already stated, minor injuries and especially repeated ones are perfectly capable of producing the separation. Static influence, too, is a continuous strain. The late establishment of the deformity after strain or injury have ceased to assert themselves offers a striking analogy to the posttraumatic kyphosis of Kuemmel, especially since so-called molecular necrosis of detached bone and cartilage have been found microscopically in cases of traumatic coxa vara adolescentium.

In the third place, the loss of function in these cases is never absolute or immediate, except in cases of great violence or injury. In fact, in most cases there is a period of functional integrity, the impairment following later and slowly according to the progress of the deformity.

Among approximately 1,000 orthopedic cases I have found traumatic separation of the epiphysis either clinically or radiologically or both, in ten cases, equaling 1 per cent. Short abstracts of the histories follow:

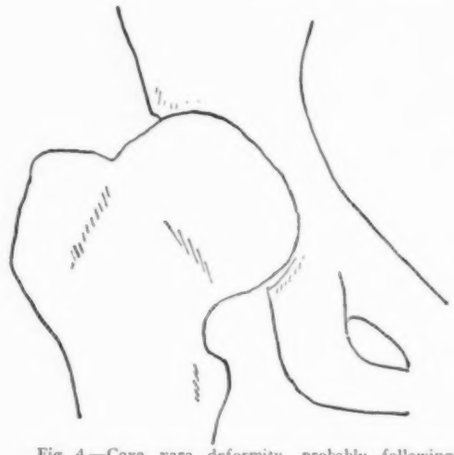

Fig. 4.—Coxa vara deformity, probably following epiphyseal separation (Case 10).

Fig. 5.—Coxa vara deformity, probably following epiphyseal separation (Case 10).

CASE 1.—J. J., aged 12. March, 1913. No trauma given. Complains of pain in right hip and limp for four weeks. Increasing disability. No night cries, no temperature. There is restriction of abduction and inward rotation. The Roentgen ray shows traumatic separation of the epiphysis with partial atrophy of the head (Fig. 1).

CASE 2.—E. G., aged 11. April, 1914. A few months ago sore throat followed by pain in right hip. Confined to bed for three weeks, when symptoms subsided. After getting up a limp gradually developed. No night cries. Hip partially fixed in adduction and outward rotation. Abduction nil, inward rotation very limited, flexion free, extension limited. Roentgen ray shows slight displacement of right epiphysis. Diagnosis, epiphyseolysis following acute epiphysitis (Fig. 2).

CASE 3.—C. F., aged 13. March, 1914. Slight trauma two months ago (fall on right hip). Suffered no loss of function. Pain and limp developed gradually in the last few weeks. Increasing shortening. No night cries, no temperature. Right hip in adduction. Abduction nil, adduction free, out and inward rotation free. Roentgen ray shows slight epiphyseal detachment. Diagnosis, traumatic separation of the epiphysis. Spica and crutches.

CASE 4.—L. P., aged 19. March, 1914. Limped with right limb for a number of years, does not know how long. Deformity increasing. No trauma given. Hip in adduction. Abduction slightly restricted, inward rotation considerably so. Outward rotation normal, extension and flexion slightly restricted. Roentgen ray shows coxa vara deformity with overlapping head of the femur. Diagnosis, coxa vara capitalis, statica (?). Operative correction advised.

CASE 5.—P. K., aged 9. April, 1914. History very incomplete. Has been limping for a year or so. No pain, no night cries. No trauma. Hip in adduction and eversion. Abduction restricted, all other directions appear to be free. No temperature. Roentgen ray shows slight epiphyseal displacement with partial absorption of the head. Diagnosis, separation of epiphysis, secondary atrophy (epiphysitis?).

CASE 6.—L. E., aged 9. November, 1913. Has been limping since last July after a fall out of a trapeze. From this time he also has complained occasionally of pain in the knee (left). No pain in hip, no night cries, no temperature. There is slight restriction of abduction and flexion abduction. More restriction of extension. Slight atrophy. Roentgen ray shows some epiphyseal displacement and signs of absorption. Diagnosis, coxa vara traumatica with posterior separation of epiphysis.

CASE 7.—V. M., aged 11. December, 1913. Was hurt two months ago while playing by being pulled violently by his right limb and stepped on on the right hip by one of his playmates. He was lame for three days but after that he managed to go to school. He again complained of pain in right knee and thigh soon afterward. There was also pain in the small of his back. At that time he was very restless but is better now. No night cries. Gradual impairment of function. At time of examination does not bear weight on his limb at all.

but walks on crutches with the limb drawn up. There is tenderness over the right sacro-iliac region and in front of the thigh and very distinctly in the gluteal region and over the greater trochanter. There is no distinct restriction of motion. The Roentgen ray shows a separation of the head ¼ inch and about the same in the apophysis of the greater trochanter upward. Diagnosis, traumatic separation of epiphysis and trochanter major. Plaster spica and crutches.

CASE 8.—M. M., aged 14. May, 1912. Had a fall December last, landing on his back and left hip. After a free interval of three weeks he developed a limp and some soreness of left hip, but no nightly pain. He was put to bed for two weeks and the limp disappeared. After he got up he started to limp again, which he has done to the day of examination, the disability becoming gradually worse. The left thigh is in adduction. Motion is limited in abduction and inward rotation. No actual shortening. Trendelenburg symptom positive. The diagnosis coxa vara traumatica from epiphyseolysis is confirmed by the Roentgen ray.

CASE 9.—Mrs. S., aged 29. December, 1912. When 3 or 4 years old she had a fall, injuring the right hip. As far as she remembers there was a gradual drawing of the hip and an increasing limp, shortly after the accident, but no severe or nightly pain. Was always able to bear weight on the hip, but complains more for the last six months. The hip is incompletely fixed in adduction flexion position, abduction and inward rotation being completely abolished, while the other directions are comparatively free. The real shortening is only ¼ inch. The diagnosis is coxa vara traumatica from separation of the epiphysis. No roentgenogram could be taken (Fig. 3).

CASE 10.—V. P., aged, 16. April, 1913. October last he slipped and fell on his left hip, but was not disabled for two weeks. Then he began to get worse, complaining of pain and limping and was put to bed for three weeks. Though he regained the function of his leg, the limp has been steadily increasing, also increasing shortening. There is considerable adduction contraction with outward rotation, and limitation of abduction and inward rotation. The other directions comparatively free. The Roentgen ray shows coxa vara deformity, probably following epiphyseal separation (Figs. 4 and 5).

REVIEWING THE POINTS SIGNIFICANT FOR THE DIAGNOSIS

Injury to the hip of moderate extent, fall or wrench.

An intermediate period of functional freedom.

No or very mild subjective symptoms.

The late and gradual development of the coxa vara deformity with increasing disability.

The age of the patient.

I do not think that absolute reliance can be placed on the Roentgen-ray evidence, inasmuch as very slight lesion will not show any more than they do in injuries to the spine which are later followed by Kuemmel's posttraumatic kyphosis. Still it is an invaluable aid.

203 Flynn Building.

Memory and Education.—Memory is a fundamental phenomenon of organic life. In its widest sense it signifies the fact that impressions once received by an organism are retained for a greater or less period and that this retention is indicated in the modified behavior of the organism. The evidence of memory in animals is their ability to profit by experience. A white rat is placed at the entrance of a maze at the center of which is food. The animal moves about in an aimless manner until at length it reaches the center. If on succeeding trials the rat shows an improvement in the accuracy and rapidity with which it moves about the maze, this means that its earlier attempts have in some sense left their effects; they have modified in subsequent conduct. Memory, when used in this widest sense of the term, lies at the basis of all learning. It is a measure of educability.—Solvin.

COXA VARA*

JOHN RIDLON, M.D.
CHICAGO

Perhaps the most valuable paper that has ever been written on coxa vara is that of Elmslie,[1] which appeared in 1913.

For the sake of giving Elmslie's views a wider circulation it has seemed to me better to make this paper a review rather than attempt a personal paper on the same subject. Elmslie says:

Coxa vara is an anatomical term indicating the condition of depression of the neck of the femur, so that the angle that the neck of the femur makes with the shaft, normally about 125 degrees, is lessened. Such depression of the neck of the femur may occur by bending at the root of the neck, in the middle of the neck, or close up to the head of the bone, or there may be a general curvature of the whole neck.

The clinical manifestations of coxa vara are, briefly, diminution in the degree of abduction permitted at the hip-joint with real shortening, manifested by elevation of the trochanter. Several other conditions occur in which these clinical manifestations are found, but in which the radiographs show a deformity of the head of the femur rather than a depression of the neck. These are best excluded from coxa vara; they are: (1) results of old inflammatory disease, either acute, such as epiphysitis or chronic, as tuberculous disease; (2) osteo-arthritis, and (3) pseudo-coxalgie (Clave).

Even though we limit the name coxa vara to an actual depression of the femoral neck, we are still left with an anatomical condition which may vary in different cases, and which may result from different pathological processes. The pathology of some of the forms of anatomical coxa vara is clear and needs but very brief allusion. These conditions can be included under two headings: (1) injury; that is, fracture of the neck of the femur, with union in a deformed position; (2) processes in which the bone is known to be definitely softened and to give way under pressure; i. e., rickets, osteomalacia, osteitis deformans, osteitis fibrosa.

To these groups I shall not allude further except that the pathology of the idiopathic varieties of coxa vara is intimately connected with the question of the occurrence of fracture of the femoral neck in children, and that it is necessary to include a brief description of the anatomy of rickety coxa vara. We are left with idiopathic cases of coxa vara, which may be classed according to their history and anatomy into three groups: (1) congenital; (2) infantile or cervical (*a*) with a fibrous intersection in the neck, (*b*) with a strong neck without any fibrous intersection; (3) adolescent, and possibly a few aberrant cases which do not fall properly into any of these groups.

I have not been accustomed to consider any cases as true coxa vara when the pathology was as stated above, but have limited the use of the term to a giving way of the epiphyseal line between the head and neck to a greater or less extent—an extent sufficient to give sooner or later the characteristic symptoms of coxa vara. That diagnostic symptoms of coxa vara may be present before roentgenoscopy will show a slipping at the epiphyseal line and before any certain shortening can be measured has been demonstrated by Case 1, to be recorded later on.

It is true that most cases of coxa vara appear at about the period of adolescence, but since all cases do not appear at this time and since it has not been

* Read before the Section on Orthopedic Surgery at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

1. Elmslie, R. C.: Coxa Vara, Its Pathology and Treatment, London; Henry Frowde, Oxford University Press, and Hodder and Stoughton, 1913, price 2 shillings net.

shown that the adolescent period is an etiologic factor in these cases, I think it best to dissent from Elmslie's use of the term. The same may be said of injury as an etiologic factor; by no means do we find a history of injury in all cases. I have observed two bilateral cases. In neither were the hips attacked at or near the same time, and in neither of the four hips was there any conscious injury at or about the time that shortening occurred. It is equally true, as Elmslie has noted, that coxa vara is found much more frequently in boys than in girls. We do not say boys' coxa vara, since girls also suffer; and we ought not to call it adolescent coxa vara, since it occasionally occurs at other periods, or traumatic coxa vara, for frequently there has been no known injury. Let us then call it coxa vara, which without qualifying adjective indicates the pathology, and let us clearly separate coxa vara from fracture of the neck of the femur in children and adolescents.

Under symptoms and physical signs, Elmslie says:

A few points in the clinical symptoms of adolescent coxa vara assist us to form views as to the pathology—in the first place whether there is an accident or not there is nearly always in the progressive stage of the deformity a period during which the movements of the hip-joint are almost or quite abolished. Hofmeister in his first contribution to the subject laid stress upon this stage, but it seems to have been forgotten by many surgeons, who, on account of the fixation of the joint, make the diagnosis of tuberculous disease of the hip. The rigidity is due entirely to muscular spasm; it disappears when the joint is examined during anesthesia, and its presence is easily understood when it is remembered that the lesion in adolescent coxa vara is close to the epiphyseal line and that this line is entirely intra-articular. During this stage there is also pain in the hip, extending down to the knee, rapid wasting of the muscles of the thigh and buttock, and a fulness in Scarpa's triangle. These symptoms also are like those of tuberculous disease; they indicate only an intra-articular lesion of the hip-joint.

This period may last a few weeks or several years; sooner or later the movement returns, and the deformity only remains. The limb is now shortened, adducted at the hip-joint, and everted; occasionally also it is a little flexed. The real shortening, measured from the anterior superior iliac spine to the internal malleolus, is seldom more than an inch; the total apparent shortening, measured from the umbilicus to the internal malleolus, is often as much as 2½ or 3 inches; this and the eversion are usually evident at a glance. The great trochanter is raised to a degree corresponding with the real shortening and is very prominent. Movements at the hip-joint are usually in the later stages free, except abduction and internal rotation, which are limited by anatomical factors.

I have always regarded the position of adduction and outward rotation, with abduction and inward rotation limited, as the first typical symptoms of coxa vara. Flexion also will be found restricted, but it will be found that the thigh can be flexed further if somewhat abducted during the movement than if carried upward along the anteroposterior plane. These symptoms and the fulness in the groin may be explained by the course of Case 1, in which unquestionably the epiphyseal line opened up anteriorly some months before the cervical side slipped upward on the caput and a true coxa vara showed in the roentgenograms.

To quote again:

In acute traumatic coxa vara a definite downward displacement of the epiphysis of the femoral head is seen, the upper part of the fractured end of the neck appearing above as a prominence. In cases following at an interval after an accident, after several slight accidents, or without any accident, the appearances are almost identical and are as follows: The head of the femur is displaced downward, so that the lower part of its joint surface no longer lies in the acetabulum. In spite of the fact that most radiographs are taken with the limb everted, the head does not appear unnaturally large; this indicates that it is displaced posteriorly. The epiphyseal line is, as a rule, clearly seen. It appears unnaturally long in some radiographs; this is probably due to the fact that the head is not seen from its true anterior aspect. Thus, considering the epiphysis as a cup-shaped disk with the concave side toward the neck, the view includes part of this concave surface. The femoral neck in most cases shows two parts; the part next to the shaft has its natural direction, at any rate as regards its lower border; the upper part, though springing naturally from the trochanteric region, being rounded off above. The part of the neck near the head, however, slopes downward and inward to join it; the lower border here takes as a rule a sharp downward curve like a hook, and below the head overhangs it "like a mushroom." The upper border of this part forms a continuous upward convexity, internally continuous with the surface which faces the epiphyseal line; it shows, however, in many radiographs a prominence varying in size and situated nearly opposite the upper margin of the acetabulum. This, doubtless, is the spot to which the outer extremity of the epiphysis was attached.

After considering the various other forms of so-called coxa vara, Elmslie's conclusions are:

Coxa vara is a deformity, then, of the upper epiphyseal region of the femur and varies in its anatomy as it comes on: (1) before birth, when a strong neck pointing in an abnormal direction results; (2) during the first five or six years of life, while the neck of the femur is largely cartilaginous, when the depression is at the root of the neck of the femur, with usually a fibrous intersection across the neck; (3) during adolescence when there is a slipping downward and backward of the epiphysis. This deformity is undoubtedly due often to accident; there is a difference of opinion among authors as to whether the more usual accident in childhood is a displacement of the epiphysis or a fracture of the neck; the truth, I believe, is that during the earlier years of life, before there is a well-shaped neck, the accident is a fracture of the neck; later, when there is a well-formed neck and a transverse epiphyseal line separating it from the head, the injury is a separation of the epiphysis. We find, therefore, that the coxa vara of young children is cervical in type, the coxa vara of adolescence is epiphyseal. Accident will not account for all cases, but we know that the non-traumatic cases have the same pathological anatomy as the traumatic cases occurring at the same age period; we must presume, therefore, that in them there is the same displacement, but that there is no definite injury to produce this, that some local pathological condition of the bone exists which enables such displacement to occur with great ease.

On analogy with such conditions as adolescent genu valgum, on the microscope findings in cases of resected specimens and on the undoubted occurrence of infantile coxa vara in rickety children, we may presume that this pathological condition consists in a defective ossification of the bone formed at the upper epiphyseal line of the femur. As has already been briefly indicated, the occurrence of coxa vara deformity alters the direction of the pressure of the weight of the body on the neck of the femur. In those cases, such as the congenital, in which there is a strong neck and no displacement of the epiphysis, this altered pressure will not tend to greatly increase the deformity. In the ordinary type of infantile case, however, this alteration brings the pressure of the upper margin of the acetabulum directly across that weak part of the neck which contains the fibrous intersection, and in the ordinary adolescent form similarly the pressure of this margin of the acetabulum is brought directly across the region near the epiphyseal line, at which the displacement

of the head of the femur has taken place. As a result, in these two forms of coxa vara, when once a moderate degree of deformity has arisen, there is a mechanical factor in the shape of the weight of the body acting through the acetabulum which will tend to increase the deformity, quite apart from the existence of any pathological process. This mechanical point is of great importance in treatment.

Nowhere in Elmslie's paper do I find that he has noticed that which has been noted by many others, namely, the great frequency with which we find these boys having coxa vara to be fat, and if male of the feminine type, and with underdeveloped sexual organs. All children of this type should be constantly under medical supervision and such preventive diet and drug treatment as seems indicated.

For prevention of the increase of deformity Elmslie recommends the use of the Thomas caliper splint, made long enough to prevent the weight from being transmitted through the hip to the ground. This of course is a most reasonable theory, but as a clinical fact it does not prevent the increase of deformity, nor, as in Case 1, does it prevent shortening when no shortening has yet occurred.

Elmslie mentions forcible abduction during narcosis, but appears to have had but a single experience with a doubtful result. He also mentions the various operations of osteotomy without any evident devotion to any one of them.

I have treated all cases of coxa vara for the past four years by strong traction with the limb abducted, the patient not being anesthetized, and while the limb was held in this position have applied a plaster splint from the ankle to the nipples. I have allowed the patients to lie still or walk about as they might choose; and have continued this treatment until the patient had walked without pain or sensitiveness for at least three or four months.

CASE 1.—This boy, R. R., was just 12 years old, short and weighed 110 pounds. His sexual organs were extremely undeveloped. He began to limp three months before examination after riding a donkey up Mount Vesuvius and climbing the dome of Saint Peter's at Rome. The left leg lay rotated outward. Except to inward rotation all movements at the hip were resisted when carried to their extremes. In flexing the thigh it circled outward. There was no shortening, and the Roentgen-ray pictures were negative. After three more months without material change a long traction hip splint was applied to be used as a perineal crutch. Despite this, at the end of six months there was ¾ inch shortening and the roentgenogram showed a typical coxa vara. The patient was anesthetized, and the leg stretched forcibly and put up in plaster in abduction. For some time the patient remained in bed, then used crutches, and finally walked in the plaster splint without crutches until all evidences of sensitiveness had passed. Somewhat more than a year later there was some sensitiveness in the right hip and some restriction to motion, but no shortening; after six months or more shortening developed, and the roentgenogram showed coxa vara in that hip. Now the hips are practically alike. When he sits with the knees a foot apart the feet cross because of the outward rotation of the thighs.

This case shows conclusively that the epiphyseal line may open up in front, giving outward rotation of the thigh, some months before the neck becomes detached from the head and slips upward into the characteristic relation. And it demonstrates that we are warranted in making the diagnosis of coxa vara when the clinical symptoms of coxa vara are present sometime before the displacement can be demonstrated by roentgenoscopy.

CASE 2.—This case, although apparently typical of coxa vara, is exceptional in my experience. The boy, E. B., fell a distance of 10 feet to the ground nine and one-half months before the picture was made. There was ¾ inch real and 1¼ inches apparent shortening; ¾ inch atrophy of the thigh and ½ inch of the calf; 35 degrees flexion deformity; a small fluctuating tumor on the anterior and outer aspect of the thigh, and only slight motion in flexion and rotation.

CASE 3.—This case, apparently typical coxa vara, is somewhat unusual. The boy, A. P., was 7 years old. He had limped for a year; cause unknown, but had jumped a good deal. There was ⅝ inch shortening, and possibly ⅛ inch atrophy of thigh and calf. Rotation was restricted, but there was nearly full flexion and hyperextension.

CASE 4.—This man, F. M., when a youth worked hard on a farm. He gradually became lame when about 14 years old, and the leg became short. He was taken to a prominent Chicago surgeon, now dead, who said it was not hip disease, and advised stopping work and better feeding. Later he consulted another prominent surgeon of Chicago, also deceased, who asserted that it was tuberculous hip disease and applied an extension splint and crutches. Then pain came in the other hip, and again the diagnosis was tuberculosis, and he was treated in bed with weight and pulley to both legs for nineteen months. At a later period he had another year in bed. Finally in 1911 he was sent to bed again for a year with weight and pulley treatment by one of our noted Chicago surgeons, now living. In January, 1912, this man was brought to me the distance of about one hundred miles on a cot with weights attached to his limbs. There was 1 inch real and 2¼ inches apparent shortening; no atrophy of thigh or calf. There was no rotation and little flexion at the right hip. Roentgenoscopy revealed the left hip normal and the right hip having an ancient coxa vara.

CASE 5.—This boy, C. B., aged 15, began to limp without known cause eight months before I saw him. The limb was adducted and rotated outward. No real shortening but 1½ inches false shortening. There was slight restriction to flexion, and sensitiveness to hyperextension and inward rotation. He was treated with a long traction hip splint for about three years.

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ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. STEINDLER AND RIDLON

DR. WALLACE BLANCHARD, Chicago: Two or three years ago, I reported two cases of coxa vara before the American Orthopedic Association. In one the condition was clearly inflammatory. It occurred in a boy of 18 or 20 years, who had been very sick with diphtheria and had made a slow recovery. The diphtheritic infection occurred when he was about 12 years old. He was in bed for about a year but gradually recovered. During the succeeding two or three years, nothing unusual was noticed. Then coxa vara slowly developed. The deflection downward was about 120 degrees, with a mushrooming of the heads. I presented, in connection with this case, one of idiopathic coxa vara, in a boy about 14 years of age. He had no history of injury, and had not had any symptoms of rickets; but at about the age of 13 he was noticed to walk somewhat differently, with an incurved back, presenting something of the appearance of a double congenital hip dislocation. This gradually increased. When I saw him the head and neck of each femur were deflected downward about 120 degrees. The deformity was symmetrical in both hips. I asked Dr. Ridlon where he would place it, according to Elmslie's classification; and he said that he did not know.

DR. W. C. CAMPBELL, Memphis, Tenn.: I have had four cases of apparent coxa vara in private work, which later developed into tuberculosis of the hip. All the patients were between the ages of 8 and 10 years, an age at which you would not expect to find a separation of the epiphyses in this region. Roentgenoscopies were made in all the cases; and in none, at first, did there appear to be any changes that we could discern. Later on, however, they showed tuberculous changes in the region of the epiphyses. The symptoms in the early stages when these cases were seen

were limitation of internal rotation and abduction. There was very little pain and none of the usual symptoms of tuberculosis of the hip were present. I feel sure from these cases that tuberculosis of the hip may give, in the beginning, the identical symptoms of coxa vara. This did not occur to me until these cases came under my observation about two or three years ago at nearly the same time. The clinical symptoms later, the Roentgen-ray findings and the treatment throughout the whole course of the disease were those of tuberculosis of the hip. They were definite cases of tuberculous hip. I had had other cases of coxa vara, particularly in adolescents and young children; but I had never seen an acute coxa vara at that age, and this made me doubt such a diagnosis though all symptoms and physical signs pointed to that condition.

DR. J. D. GRIFFITH, Kansas City, Mo.: I have had only one case but from the study of that and the literature that I could find on the subject of coxa vara, including the work mentioned by Dr. Ridlon, I came to the conclusion that there was only one solution of coxa vara. It belonged to the domain of metabolism. Here was an area that was imposed on by the body weight; and if, during the course of development, there was not a sufficient deposit of salts in the line of epiphyseal union, as Dr. Ridlon has pointed out, the result could easily be a diminution in the distance between the trochanter and the head of the femur and a change in its angulation. In this condition, following an enteroptosis or anything else that might produce an improper metabolism, there might be absorption of the material thrown out; and I think that if we could get at the histology of the metabolic changes, we should find the cause of the trouble. My case was in a child who had no trouble until he commenced to bear his weight, at the age of 3 years. Then he began to have some trouble in his hip. I could not make out, by means of the Roentgen ray, or anything else, any tuberculous trouble; but here was a distinct coxa vara at the age of 8. I then made up my mind that this was due to a metabolic trouble. Only three weeks ago, the patient being still under treatment, he came to my office again and I found that the other hip was commencing to show the same process. I am satisfied that tuberculosis has nothing to do with the condition in this case.

DR. REGINALD H. SAYRE, New York: I believe that a great many of these patients, undoubtedly, as Dr. Griffith says, suffer from a disturbance of metabolism; and that, as shown by the Roentgen ray, the appearance is not that of tuberculosis. One must get a good roentgenogram that shows bone definition, in order to examine these cases. One does not always get that; but in many of these cases one can see that a change is going on in the neck and in the epiphysis. Taking a series of roentgenograms, month by month, at times a thickening of the periosteum of the external layer can be seen where nature is trying to brace up a softened part of this neck; and unless these cases are treated by removing the weight-bearing, by ambulatory splints, the bearing of the weight on this soft bone will result either in telescoping of the bone and coxa vara of that kind, or in separation of the epiphyses from some trivial thing like stubbing the toe, as I have seen happen. I believe that they are not tuberculous cases, but are due to some other disturbance of nutrition. In some instances I have thought them syphilitic. In others they have appeared not to be so. In a number of cases the children are fat and have very slightly developed genitalia, and at times they have had more or less general malaise and ill health, following some disturbance such as measles.

DR. GWILYM G. DAVIS, Philadelphia: An interesting case came under my observation recently. The patient was a boy 15 years old, who, over a year ago, was thrown from a sled and hurt his hip. He was under treatment for a short time and apparently recovered. Several months later he began to limp. After a time he would cease to limp, but later the limp would return. He was brought to me more than a year after his original injury and a roentgenogram showed a separation—or rather, displacement—of the epiphysis. The case belonged to the coxa vara capitalis class referred to by Dr. Steindler. The epiphysis of the head was distinctly tilted downward, so that the hooked edge on the lower surface could be seen; but there was no change in the axis of the neck with relation to the axis of the shaft. Tuberculosis had been suspected, and the family history showed that taint in it. Now what is this boy suffering from? A dyscrasia like latent rickets, or solely as the result of an accident? If he is a healthy boy who has simply had an epiphyseal separation, what explanation can be given of the recurrent trouble? There is ¼ inch of shortening. I have seen cases of epiphyseal separation from fractures of the neck in children and they repair as quickly as any other fractures. This boy gets better, and then worse. Is it accounted for solely by the static condition? It may be; because he is extremely fat, heavy and big for his years. To such an extent is this so that it is suspected of being a case of infantilism. It may be that it is a case of lack of development, in which case one would put the boy, possibly, on pituitary extract. The whole question, to my mind, is an exceedingly obscure one and difficult of solution.

DR. EMIL S. GEIST, Minneapolis: I believe that the subject of coxa vara will attract our attention a little more in future, since we have learned that some cases of coxa vara have been found in cases of congenital dislocation of the hip, in which reposition has been successful and the head centrally located. I have such a case to report, in which the operation of Lorenz was done on both sides eight years ago. The child is 14 years of age now, well developed and heavy. The heads of both femurs are in their sockets, but there has supervened a marked degree of bilateral coxa vara, giving the child a moderate "waddle." This will, perhaps, happen to any of us in some of these cases in which we have attained and maintained reposition.

DR. JOHN RIDLON, Chicago: In the last part of my paper, which was not read, I mentioned the condition referred to by Dr. Sayre and said that in the vast majority of the cases the children are fat and have undeveloped genitalia. It is the opinion of some internists that this condition of fatness and lack of sexual development is due to a want of normal balance between the thymus and the thyroid gland, and perhaps some of the other ductless glands are working irregularly. You may, however, find the feminine type of male in some cases without the excessive fat, and among these a good many of these cases of coxa vara that are not associated with fat. I formerly employed the long traction splint in the treatment of such cases, but I have now ceased entirely to use it; because in Case I, in which there was a bilateral coxa vara, the deformity in the second hip developed a year or a year and a half after the first hip was well. In that case, I put on the ambulatory splint, a long traction splint, without traction being applied, to act as a peroneal traction. I put it on before there was any shortening or any evidence of coxa vara by the roentgenogram, and while wearing the splint he developed the shortening and a coxa vara that could be seen in the roentgenogram. The symptoms of lack of rotation and lack of abduction were present from the beginning. I am sure that the long traction splint will not prevent the development of coxa vara or help its cure, because I have seen patients recover without the long traction splint, without protection or any treatment at all, as quickly as when they have worn a protective splint. I am accustomed to stretch the leg with a machine, with abduction as far as is normal and to put the patients at once in the plaster spica and have them walk on the leg for some months until all evidence of sensitiveness has passed. I have had better results and a greater degree of lengthening in this way than with the traction splint. As to the relation of congenital dislocation of the hip to coxa vara, mentioned by Dr. Geist, I would say that I did not understand the case that he has in mind to be a case of coxa vara at all, any more than were those in the photographs shown by Dr. Steindler. Only one of those is coxa vara as I understand it. In replacing congenital dislocation, when the shortening is 1¼ to 2 inches and the muscles are very short, so that it takes two or three years to get the leg into normal rotation with a reasonable degree

of motion, there is always an atrophy of the head of the bone from pressure due to the shortened muscles; just as in replacing a traumatic dislocation that has been out a long time. I replaced one that had been out three years, in a boy of 17; and two years afterward when he was going around on the leg, trying to get motion in it and to get it in the normal position, I found that there had been considerable pressure atrophy of the head of the femur. Therefore, change in and shortening of the head are, in my opinion, due to the pressure from shortened muscles, and not to congenital dislocation.

DR. ARTHUR STEINDLER, Des Moines: The pictures that I exhibited were of cases of epiphyseal separation, so far as the roentgenogram gives information. I believe that not all epiphyseal separations show in the roentgenograms, and I should not rely on the picture entirely for the diagnosis; but two or three of my pictures do show an epiphyseal separation and a slipping of the epiphysis on the head, which has been described by German authors, producing a deviation in the axis of both the head and the neck of the femur. The patients were photographed a few weeks after the injury, as soon as the limp developed, and had not had time to develop coxa vara. I want to emphasize that the relationship of slight hip injuries to the possible development of coxa vara adolescentium has been established. All the cases that came under my care were traumatic, and a minor injury of that kind will bring about a separation of the epiphyses with the same degree of probability that a fall in the aged will produce fracture.

SEPARATE RENAL FUNCTION

OBSERVATIONS AS DETERMINED BY THE URETER CATHETER AND PHENOLSULPHONEPHTHALEIN *

GEORGE GILBERT SMITH, M.D.

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Enough has been written about phenolsulphonephthalein to establish the value of this drug in the determination of renal function. It has seemed to me, however, that certain observations based on its employment in determining the function of the kidneys separately might be worth recording. The cases on which these observations were made were taken from private practice and from the records of the genito-urinary department of the Massachusetts General Hospital. The tests were done by me or by some other member of the genito-urinary staff.

The technic employed by all was essentially the same. When possible, both ureters were catheterized; if only one could be entered, the urine from the other was collected by a catheter in the bladder. After the urinary flow was established, 1 c.c. of solution containing 6 mg. of phenolsuphonephthalein was injected subcutaneously, intramuscularly or intravenously. The flow from the catheters was caught in test-tubes containing several cubic centimeters of 25 per cent. sodium hydroxid. The urine in most cases was collected from each side for fifteen minutes after the pink color first appeared from that side. These specimens were made strongly alkaline, diluted to 1,000 c.c. with water, and the percentage of dyestuff estimated by means of a series of graduated tubes of phenolsulphonephthalein solution, or by the Dubosc colorimeter. In most of the cases before the catheters were removed, the presence or absence of color in the bladder was ascertained by urethral catheterization.

In the earlier days of this test, the drug was injected subcutaneously or intramuscularly. We have noticed no important difference between the results obtained with one or the other of these methods.

We have the records of seven cases studied in this way and reported in such form as to make comparison possible. The results can be shown best in tabular form (Table 1).

In this series the time of appearance from the healthy kidney ranged from six to thirteen minutes, and corresponded fairly closely with the appearance time as determined in the test for total function. The percentage excreted by both kidneys together in the first fifteen minutes after the color appears should, judging from this series, amount to 6 or 8 per cent. when the total for one hour is about 40 per cent.

Following the intramuscular injection of phenolsulphonephthalein, the amount excreted in fifteen minutes is rather too small for careful estimation. Inasmuch as it is desirable to reduce the length of time required for the test, and since a much greater quantity of the dye is excreted in the same time after intravenous injection, this method has superseded the others for the past two years.

The results obtained are shown in Table 2.

The time of appearance from healthy kidneys after the intravenous injection of phenolsulphonephthalein ranges from one and one-half to six minutes, and in most of the cases is about three minutes. From the diseased kidney, the color may appear with very little delay, in spite of a function only one-quarter or one-sixth as great as that of the sound kidney. The percentage of phenolsulphonephthalein put out in fifteen minutes by the healthy kidney when its fellow is dis-

* Read before the Section on Genito-Urinary Diseases at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

TABLE 1.—AFTER SUBCUTANEOUS OR INTRAMUSCULAR INJECTION

Condition of Diseased Kidney	Sound Kidney		Diseased Kidney		Total for 1 Hour	
	Appearance Time, Min.	Per Cent. in 15 m.	Appearance Time, Min.	Per Cent.† in 15 Min.	Appearance Time, Min.	Per Cent.
1. Tuberculosis	7	3	No color*	±	8	28
2. Tuberculosis	13	6	No color*	0	14	40
3. Essential hematuria (nothing found at operation but hem. stopped	10	5	18	3	10	40
4. Bilateral infection			8	2	7	28
			9	2		
5. Pyelonephritis	8	3.5	13*	2.5	12	41
Two cases in which the urine was collected for 30 minutes:						
6. Tuberculosis	7	15	15*	±	—	—
7. Tuberculosis	6	16	No color*	0	6	35

† The sign ± indicates trace.

* Ureter not catheterized; color obtained from bladder.

eased may range from 13 to 30 per cent. Case 11, in which there was proved to be no leakage about the catheters, put out 13 per cent. from the sound and 4 per cent. from the diseased side in fifteen minutes, yet the total function was 45 per cent. In nine cases out of the fourteen the function of the healthy kidney was between 20 and 30 per cent.; six of these put out 25 per cent. or better. To compare the work of these kidneys, whose mates were diseased, with pairs of healthy kidneys, we selected two outpatients who were under treatment for chronic urethritis and whose urines were normal, gave 6 mg. phenolsulphonephthalein intravenously and took the urine from the bladder at fifteen-minute intervals after the first appearance of color. The percentages were estimated by means of the Dubosc colorimeter.

CASE T.—Appearance time, five minutes; first period, 60 c.c., 30 per cent. Second period, 50 c.c., 21 per cent. Third period, 80 c.c., 18 per cent.

CASE H.—Appearance time, three minutes. First period, 110 c.c., 33 per cent. Second period, 120 c.c., 19 per cent. Third period, 100 c.c., 8 per cent.

Thus we see that in the first fifteen minutes a normal kidney should put out half of about 30, or 15 per cent. Only three of the sound kidneys in this series put out as little as that; most of them were already well along towards taking on the work which both kidneys should do.

As regards the output of the diseased kidney, we find in this series a fairly definite relation existing between the amount of dye excreted and the amount of kidney tissue. If there is little or no infection, this relation is very constant; if infection is an important feature, the function may be temporarily lowered by the interference of the exudate with the metabolic processes. The increase of function in Case 14 occurring after the removal of stones illustrates this. Case 13, with a good-sized stone in the pelvis, and no infection, showed a function of 25 per cent. Tuberculous kidneys in several instances have shown an unexpected decrease in function, considering the apparently large amount of healthy tissue in the gross specimens. In case 21, for example, with relative functions of 18 and 7 per cent., the diseased kidney showed nothing wrong except an abscess 2 cm. in diameter, and a sprinkling of miliary tubercles throughout the upper pole.

In the main, the phenolsulphonephthalein test in our hands has reported the value of each kidney with great faithfulness. Two cases in our series illustrate its accuracy unusually well, and will bear reporting in more detail.

Jan. 27, 1912, a woman of 29, Case 16, was cystoscoped. Clear urine and 10 per cent. dye were obtained from the left kidney; infected urine and 12 per cent. from right. The pelvic capacity of the right kidney was 40 c.c. and because of pain in that side the right kidney was explored by Dr. Hugh Cabot, the ureter freed and the kidney suspended. The pain was only partially relieved; the infection continued, and in July, 1913, the ureters were again catheterized. From the left kidney 30 per cent., from the right only 9 per cent., was obtained. It was obvious that the right kidney was losing ground, while the left was taking over its work. In September, 1913, the right kidney was removed and found to be one-third the size of a normal kidney and to consist chiefly of calices and pelvis.

The other case is that of a man of 37, who two years before had had a right-sided "nephritic abscess" opened and drained. Cystoscopy showed a slightly ragged, red orifice on the right. The left was normal. Both ureter catheters yielded clear, sterile urine, that from the right kidney containing very rare small granular casts. Intravenous phenolsulphonephthalein appeared in five minutes from the left, and in thirty minutes 15 per cent. was collected. Although the right catheter drained well, no color appeared during the thirty-five minutes consumed by the test. I was rather surprised at this and wondered whether the test was at fault. But a total intramuscular function showed an appearance time of 12 minutes with only 18 per cent. excreted in the ensuing hour. This confirmed the diagnosis of a useless kidney on the right and a left kidney which had not taken on the other kidney's burdens, and was in fact slightly below par for one of two normal kidneys.

TABLE 2.—AFTER INTRAVENOUS INJECTION

Condition of Diseased Kidney	Sound Kidney		Diseased Kidney		Total (Intramuscular)	
	Appearance Time, Min.	Amount in 15 m. Per Cent.	Appearance Time, Min.	Amount in 15 m.* Per Cent.	Time, Min.	Amount, Per Cent. 1 Hour
8. Hypernephroma	6	10	12	3	.....	40
9. Echinococcus	4	25	5	2	13	38
10. Stone occluding ureter	3	25	.....	0	.....	.....
11. Renal stone; thin cortex	3.5	13†	8.5	4	8.5	45
12. Renal stone; kidney destroyed	4	11	10	2	.....	43
13. Bilateral renal stone (rt. not infected)	4	25	Right, 6	4	.....	.....
14. Bilateral renal stone 9 months after operation on right side	.....	.....	Left 7	11	15	20
15. Pyonephrosis	.....	.....	9	8	12	41
16. Pyelonephritis	3.5	25	8	±	.....	...
18 months later	3.5	19	3	12	.....	...
17. Tuberculosis	3	30†	8	9	.....	...
18. Tuberculosis	6	20	.....‡	0	.....	...
19. Tuberculosis	1.5	28	2.5	4	11	24
20. Tuberculosis	4	25	5.5	±	.....	...
21. Tuberculosis	3	25	.....‡	0	.....	...
	4	18	5	7	6	35

* For trace, the sign ± is used. † No leakage. ‡ Ureter not catheterized; color obtained from bladder.

The objection has been made that in carrying out this divided function test, the function of a kidney is liable to be depressed or in some way altered by the passage of the catheter up the ureter. An examination of the cases quoted above will show that in only two cases was the color obtained more quickly without ureteral catheterization than with it, and in these cases the difference was only one minute. The promptness with which healthy kidneys excrete the drug even though their ureters are catheterized upsets this objection. The amount of dye excreted, furthermore, as the tables show, corresponds fairly closely with the total hourly amount obtained from the bladder. Com-

pare the amount excreted by healthy kidneys with ureters catheterized with the standard set by the two intravenous, uncatheterized cases. The latter excreted 30 and 33 per cent., respectively; that is, 15 and 16.5 per cent. from each kidney; the percentage of these patients whose ureters were catheterized were 10, 25, 25, 13, 11, 25, 25, 19, 20, 28, 25, 25, 18. There is no inhibition of function here.

The point has been made, with much justice, that one cannot be certain of the accuracy of his results unless he has proved the absence of leakage about the ureter catheters by getting no color from the bladder while the catheters are still in place. With this position I heartily agree, but it has not been my experience to find leakage very frequently; if the ureter is not dilated, a No. 6 flute-tip catheter passed well into the renal pelvis and then withdrawn until it runs freely may be expected to carry off all the secretion of that kidney. The establishment of this point is of value in doing cases in which one ureter cannot be catheterized. In this series there are eight such cases; in four of them, no color appeared in the bladder at all, in one just a trace; in the others, the color did not appear from the bladder catheter until five, six and eight minutes after it appeared from the ureter.

The chief points drawn from this not very extensive study are these: After the intravenous injection of 6 mg. phenolsulphonephthalein, each kidney of a normal pair begins to excrete the dye in about three minutes, and in the next fifteen minutes puts out about 15 per cent. If a sound kidney which has a diseased fellow excretes 15 per cent., it is at least equal to one normal kidney; if more than that, it is already taking up the work of both. Such a kidney, according to our experience, may put out 30 per cent. in this period, or as much as two normal kidneys combined. Neither the time of appearance nor the amount excreted is materially influenced by the passage of ureter catheters, and the results of the test agree with great constancy with the actual pathologic condition in the kidney.

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ABSTRACT OF DISCUSSION

DR. B. A. THOMAS, Philadelphia: It is agreed that phenolsulphonephthalein is a useful functional kidney test. I do not believe, however, that, even in the capacity of quantitative determination, it supersedes in usefulness indigocarmin. In fact, I do not believe that it equals it, so far as relying on any single functional kidney test is concerned. We all agree that a metabolic quantitative study is the ideal procedure, but impracticable; on the other hand, that two or more tests are more valuable than one. I also believe that, irrespective of the quantitative determination, the use of indigocarmin qualitatively by the method of chromo-ureteroscopy, that is, its elimination from the ureteral orifice after intramuscular or preferably intravenous injection, has a slight advantage over phenolsulphonephthalein. In three cases I have found it absolutely impossible to catheterize the ureters even with a No. 5 catheter. There was undoubtedly a congenital stenosis of the ureteral orifices. Consequently, in such instances, any functional kidney test dependent on synchronous bilateral ureteral catheterization would prove useless. I therefore ask Dr. Smith or anyone using phthalein, if it be desirable to determine unilateral function, how is the test to be applied under such conditions? By chromo-ureteroscopy, on the other hand, it is easily possible to determine the function of the respective kidneys. Again, occasionally we will find, particularly in prostatic enlargement, the ureteral orifices so placed that it is impossible to catheterize even one ureter. Here indigocarmin once more enables us to determine the functional renal efficiency, unilateral as well as bilateral. Moreover, in quantitative determination dependent on ureteral catheterization one is not always sure of collecting the total amount of urine excreted. I have frequently seen, during the employment of indigocarmin, leakage around the catheter into the bladder. Ureteral lumina vary greatly in individuals. I believe the index of elimination, that is, the ratio of the quantitative determination of indigocarmin elimination for the third hour with the first hour, will give a more definite and reliable index of kidney stability and function than will the simple quantitative determination for the first two hours alone, because it takes into account the onset, the duration—the onset being delayed in disease, and the duration being prolonged—and also the ratio of the quantitative determination. I hope this method will be taken up by others and investigated and that it may prove to be a more definite and reliable indication of renal efficiency. I see no reason why it should not be applied to phthalein as well as indigo, although, in my experience, indigocarmin has been the more reliable.

DR. M. H. WYMAN, Baltimore: If one cannot catheterize either ureter in using phthalein, it seems to me it would be easy, although I have never tried it, to make the bladder solution alkaline. If the solution is alkaline, the first time a little spurt came into the bladder the time of appearance could be noted as easily as with indigocarmin. So I do not think that is any argument against phthalein.

DR. WILLIAM E. STEVENS, San Francisco: There seems to be a tendency at present to limit ourselves to a single test. In my opinion this is a mistake. The indigocarmin certainly is of great value, especially when it is impossible to catheterize the ureters. The phthalein test is the most popular in this country, but in a series of about 112 experiments, using simultaneously the phthalein, phloridzin and quantitative urea tests, a marked parallelism was noted in all three. The urea test did not prove to be so valuable as the phthalein and phloridzin, but in our experiments the phloridzin, both as regards time of appearance and the quantitative estimation, were certainly as valuable as the phthalein.

DR. GEORGE G. SMITH, Boston: I have no animosity against indigocarmin. I use it quite frequently when I cannot catheterize the ureters. I think it is of great value under those conditions; but phthalein is a drug easy to handle, the amount excreted is rapid of determination, and what I have tried to show in my paper is that its use is accurate and reliable. Hence, I believe it is a perfectly safe drug to use. I do not see that the index which Dr. Thomas speaks of, the comparison of the first hour's output with the third, is of any value in ureteral catheterization and divided function, because in work in a clinic one cannot keep ureter catheters in place that long.

A Clean Bakery.—Those who are familiar with the insanitary conditions surrounding the handling and sale of foods in this city in the past realize that considerable improvement has taken place, particularly within recent years. The dealers and handlers of food have gradually come to realize the importance of cleaness and decency and, still better, are learning that it pays. Witness the following sign, advertising a bakery in Avenue B, the text being reproduced verbatim from the column conducted in the *Evening Sun* by Don Marquis:

"Our bakery is not in a basement where it can't come in fresh air, and what makes not to be clean.

"But our Bakery is on the grand floor windows with enough fresh air and sunshine and that means clean enough.

"We'll be very much pleased to show all apartments and machinery from our Bakery which is made after the Sanitary Rules from the Board of Health.

"We BAKE fresh every hour.

"We burn the COFFEE ourselves."—*Weekly Bull. Dept. Health*, New York City.

HEMATOGENOUS KIDNEY INFECTIONS*

GRANVILLE MacGOWAN, M.D.
LOS ANGELES

MODE OF INFECTION

In all infectious diseases bacteria enter the blood and pass out through the kidneys. If they are few and not especially virulent no infection takes place, but if they are abundant, attached to débris which has become separated from the purulent focus in which they have their origin, of virulent strain, and one or both kidneys are injured or diseased, and there is a concomitant obstruction to the free exit of urine from the kidney, either temporary or permanent, a renal infection which may cause a severe and overwhelming toxemia and rapid death, or a slower type with or without suppuration, will surely result.

The required elements for the production of renal infections of a hemic source are the presence of pus-producing organisms and a lowered local resistance in one kidney. The first is supplied by a focus of infection always, the second by a traumatic injury to the kidney, the presence in it or its pelvis of a stone, the alteration of its tissues by a previous nephritis, stasis in its circulation due to displacement, hydronephrosis, pressure on or stricture of the ureter, displacement or sagging of the walls of the bladder, stricture, or some other obstruction to the free exit of urine from the urethra.

The micro-organisms circulating in the blood furnish the agent, the stasis of the urinary stream furnishes the opportunity, and the alterations of the kidney structure caused by disease or by trauma furnish the open door for the occasioning of the infection.

An infection of the kidney or the bladder may be esteemed as hemic in its origin when no evidence can be elicited that at any time an instrument has been introduced into the bladder or that a communication has been established between the intestine and the pelvis of the kidney or the bladder, by ulceration. It requires more than atony or paralysis of the vesical sphincters to produce an infection of the bladder mucosa. If it appears that a catheter or a cystoscope or a sound has been passed into the bladder without an accurate microscopic examination of the urine made beforehand to ascertain whether it was normal or infected urine, it may be very difficult to say with certainty whether the presence of pus-producing organisms in the urine is due to their entrance with the instrument or to their output from the general circulation with the blood-stream.

Animal experiments and clinical experience all go to indicate that ascending infections from the bladder are very rare and difficult to produce, and often in those cases in which the ascending infection would seem to be most plausible, careful post-mortem examination will show that even in the presence of atony of the ureteral muscles within the wall of the bladder, while a pyelitis or a pyelonephritis exists, the inflammatory process has progressed only a portion of the way up the ureter, showing very conclusively that the infective agent was carried either through the lymph-channels along the ureter, or had been swept directly into the blood-stream and deposited in the kidney itself.

Débris-bearing micro-organisms usually find a lodgment in the glomeruli, which accounts very well for the frequency of abscesses near the surface of the kidney in hemic infections. These minute abscesses enlarge and eventually many form one and the infection passes on to the pelvis of the kidney, either by the pus breaking directly into it or draining down indirectly by way of the tubules.

Hemic kidney infections are all accompanied by pyuria. Sometimes the process is localized in the pelvis of the kidney—a pyelitis; or there may be disseminated multiple abscesses in the cortex or the medullary portion of the kidney—pyonephrosis, a condition much more serious, frequently the result of, or accompanying a pyemia; or there may be regional abscesses situated in one pole only which tend to point to the pelvis of the kidney and to drain through it, the seriousness of which depends on their extent and the virulence of the infective agent.

Quite another form of hemic infection is a pure hemorrhagic nephritis such as is seen in impetigo in children and is probably caused by the toxins of the staphylococci present in the lesions. A like condition occasionally occurs in influenza, and this is more persistent and more dangerous.

Still another form of infection which has been reported by Ekkehorn is a *Staphylococcus aureus* mycosis occupying a portion of the kidney only—a granuloma showing granulation tissue, connective tissue and miliary abscesses.

The micro-organisms which have been known to cause hemic infection of the kidney and the urinary tract are, in the order of their frequency, colon bacilli, tubercle bacilli, staphylococci (usually *S. aureus* or *pyocyaneus*), streptococci, gonococci, *Proteus Hauser*, typhoid bacilli, paratyphoid bacilli and pneumococci.

DIAGNOSIS

These infections are simple metastases, many are very acute and very persistent, and are most likely to lead to formation of multiple abscesses in the kidney tissue, and often destroy the kidney, and not infrequently the life of the patient very rapidly. In their early diagnosis one has to depend more on exclusion than on direct symptoms, which are essentially abdominal, and frequently may indicate just as well appendicitis, cholecystitis, malaria, intestinal disturbances, abscess of the liver, toxemia of pregnancy, or acute or chronic nephritis.

The most prominent symptom, in addition to fever, is marked tenderness at the costovertebral angle, which is always present. There is continued or remittent fever according to the agent of the infection. The urine does not always give the clue to the micro-organism at fault. If the case is advanced or serious the urine from the affected kidney will contain leukocytes or pus and there will be a leukocytosis up to, but not usually over, 25,000. A severe chill usually means a

* The readers of this paper will notice that very few references are made to the authors whose works have furnished the greater part of the knowledge which is employed in the article, because the author of this paper is prejudiced against what seems to him to be the unnecessary repetition of the names of men in a scientific article. It is meant to do honor to investigators and to writers but it continuously interrupts the thread of thought for reader or writer and adds to the bulk of the article without increasing its value. The bibliography will be found attached to the article. It includes nearly two hundred separate pieces of literature written on this subject in English, French, German and Italian within the last four years, all of which, either in whole or in abstract, have been carefully looked over by the author.

* Because of lack of space this article is abbreviated in THE JOURNAL. The complete article appears in the Transactions of the Section and in the author's reprints. A copy of the latter will be sent by the author on receipt of a stamped, addressed envelope.

* Read before the Section on Genito-Urinary Diseases at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

high grade of infection. When the pelvis of the kidney alone is infected there is fever, chill, local tenderness both with and without pressure, and from the beginning the urine obtained by a ureteral catheter will show the presence of pus and pus-producing organisms, the nature of which can easily be ascertained by culture on appropriate mediums.

Acute attacks of staphylococcic and streptococcic nephritis are most frequent. They have been observed following boils, tonsillitis, acute osteomyelitis, quinsy, paronychia, ulceration about the rectum, and contagious impetigo.

In the hemic infections other than those of tubercle and colon bacilli in the urine obtained by a ureteral catheter we often find renal casts, and always numerous epithelial cells, from the pelvis of the kidney and the tubules. These organisms, being urea-splitting ones, cause a more intense irritation of the mucous lining of the secretory portions of the kidney and a more rapid shedding of the superficial epithelial layers. There is no question but that the triple phosphates present in these cases deposited on débris are one of the most potent causes of the origin of calculi within the kidney or the kidney pelvis.

TREATMENT OF RENAL SUPPURATIONS

These infections divide themselves naturally into three classes: First, those that cure themselves under an abundant use of pure water, vaccines, diet, rest, use of hexamethylenamin, potassium citrate and mild diuretics like the fluidextract of corn-silk. Second, where the kidney is the seat of multiple superficial bacterial infarcts and abscesses, requiring incision, decapsulation, evacuation of visible pus foci and drainage. Recoveries have been recorded where such abscesses have been superficial and not too numerous. Incision without decapsulation is not advisable. Third, the malignant or explosive types, characterized by great depression and marked toxemia. If the condition is unilateral, as it usually is, nephrectomy is the only remedy.

When the infection is chiefly of the pelvis of the kidney, drainage by the ureteral catheter and irrigation with mild solutions of mercuric oxycyanid, 1:10,000, or silver nitrate, from 1:20,000 to 1:10,000, are of decided value, when combined with rest in bed and hot applications. In nursing children, infections mild in form are frequent. If the urine is acid an alkaline therapy is indicated—best accomplished by the free use of sodium bicarbonate, potassium citrate and Vichy water.

In either pyelitis or nephropyelitis, any obstruction to the free exit of urine must be removed before a cure can be expected. The cause must be searched for and when found the appropriate remedy used. Strictures of the urethra or of the ureter must be dilated. If the kidney is prolapsed it must be straightened up. If there is a hydronephrosis, permanent or intermittent, either a plastic operation or a nephrectomy will be necessary.

If a stone is present, no cure may be expected until it is removed.

COLON BACILLUS INFECTION

Colon bacillus infection is the most frequent of hemic infections of the kidney. The onset is often accompanied by the presence of blood in the urine; in the absence of blood there is albumin without casts unless infection has taken place in a kidney previously the seat of nephritis. The hematuria is usually brief, but it may last weeks or months. It is extremely obstinate and never disappears permanently until after the removal of the original focus in the abdominal cavity. The attacks recur at uncertain intervals and frequently are accompanied by great pain in the kidney and a most distressing dysuria, and are often very destructive to the kidney, and may be fatal, either through an acute pyelonephritis or by a chronic toxemia giving rise to destruction of rest and interference with nutrition.

In cases that have received proper treatment it is not easy to tell always whether a subsequent attack is a fresh infection or due to a few colonies which, having escaped destruction in the kidney pelvis, have multiplied and caused a relapse.

Urine containing colon bacilli is practically always acid. It is easily distinguished from that containing other infective micro-organisms, with the exception of *Proteus Hauser*, by its remaining turbid on standing because the motile power of the bacilli keep them moving instead of sinking to the bottom as do other micro-organisms.

This infection frequently is preceded or accompanied by acute inflammatory infective processes within the abdominal cavity—often appendicitis.

The symptoms almost invariably consist of a cystopyelitis with characteristic exacerbations and remissions and a peculiar fever curve without a clear history of infection. There is always pain and tenderness over one or both kidneys with a cloudy acid urine showing microscopically motile bacilli and pus.

The first symptoms are often those of a light cystitis. Their appearance is a cheat for the real infection is of the kidney. The pain in some of these cases is atrocious, the urinary frequency so great as to require suprapubic cystotomy and twice I have seen this give no relief, the patient dying in intense agony and with continuous vesical tenesmus.

ETIOLOGY

Chronic obstipation certainly has a causative influence in the production of colipyelitis. I have seen several cases in elderly women in my practice in which the removal of fecal impactions by great doses of black draught and high colon flushes were followed immediately by an abatement of the distressing symptoms, and the tide of colon bacilli rose and fell in the urine according to the neglect or care that was bestowed on the bowels. Nearly all cases of bacilluria with pyelitis in children are preceded and accompanied by obstinate constipation and some inflammatory infection of the intestine.

TREATMENT

Some cases are entirely susceptible to medical treatment, which should consist of large doses of salol, plenty of distilled water to flush the kidneys, rest in bed, a restricted diet, and hot applications. More serious ones will frequently yield to lavage of the pelvis of the affected kidney, added to the medical measures; but in a considerable number the colon bacillus will not disappear from the urine without prolonged drainage of the entire urinary system by a retention catheter. It is difficult sometimes to carry this treatment out, because we are not always successful in impressing the patient with the seriousness of his malady, and he, often not having the time or the money, just as soon as he is relieved of the pain, the nausea and the fever, wants to get about his business. Then again the vesical tenesmus may be as intense as that

observed so often in tuberculosis of the bladder, rendering it impossible to use a retention catheter. It is marvelous to witness at times the relief afforded by ureteral catheterization and pelvic lavage. It is more particularly striking when a hydronephrosis exists.

The drugs most useful for this lavage are silver nitrate, aluminum acetate and mercuric oxycyanid, the first in a strength of from 1 : 20,000 to 1 : 10,000, which is quite as efficient as stronger solutions, and does not occasion disagreeable kidney colic; the aluminum acetate in a 2 per cent. solution, and the mercuric oxycyanid from 1 : 10,000 to 1 : 5,000. The lavage should be repeated once in five days. If the disease is confined to one kidney the ureteral catheter may lie in the kidney pelvis for several days.

Colon bacillus infection is quite a common disease in children. The majority of such cases will yield to an alkaline treatment and sweat baths. The hexamethylenamin preparations, when used with sodium benzoate, are also of benefit.

Vaccines are very useful in colon bacillus infections, more particularly autogenous vaccines. By their rational use it is quite possible to bring about the disappearance of pus and albumin from the urine and to banish the fever, but without the other measures they do not cause a disappearance of the microbes.

I would not care to treat serious cases of colon bacillus infection without these vaccines which have to be used with great caution. An overdose is often followed by a violent reaction with severe constitutional symptoms and aggravation of local conditions. I have one patient who easily takes a dose of 1,000 millions and I have another who at no time has been able to take a dose greater than 50 millions. Several times when I have tried to increase this dose the site of the injection has become inflamed, tense, excessively painful and to all appearances suppuration seemed about to take place, while chill, high fever, intense pain in the muscles of the back, headache, nausea and great mental depression followed.

The vaccines have appeared to do best when given at intervals of four days. If for any reason one is obliged to omit the treatment for a longer period than ten days, it is wise to return to the initial dose of from 10 to 25 millions.

The treatment of multiple abscesses occasioned by this infection; or of grave pyelitis or pyelonephritis that does not yield to general medical treatment plus drainage, or when the case is explosive and confined to one kidney, is the same as that for grave renal suppurations arising from other infective organisms.

PYELITIS GRAVIDARUM

Pyelitis gravidarum may be considered with coli infections. Pyelitis in pregnant women is a disease of great gravity. In 70 per cent. of the cases a colon bacillus is the infecting organism. It frequently attacks the kidney structures and destroys them and is often complicated by the formation of stones. With the pressure of the gravid uterus on the ureter occasioned by the drag of the uterus on the bladder there exists a certain atony of the muscles of the ureter, and the possibility of an ascending colon bacillus infection is greater under these circumstances than under any other that we know, for there are present all of the elements favorable to it: increased intravesical pressure, pathology of the ureteral mouths and the possibility of retrograde peristalsis in the presence of motile bacilli.

The attack is usually not sudden; a bacteriuria often exists for weeks or for months, and it is probable that in many instances a pyelitis in a mild form has existed from childhood, since colon bacillus infection of the kidney is very chronic and is often seen in female children. It is not possible always to differentiate between a pyelitis and a pyelonephritis, for casts and tubal epithelia may be present in the urine in both, from a previous nephritis existing independent of the pus infection.

The initial symptoms will sometimes resemble pneumonia, the pain in the side being close to the diaphragm causes interference with respiration and cough, but never expectoration. Persistent nausea and vomiting in the later months of gestation are very suspicious, especially when accompanied by intermittent pyuria. It is entirely different from the vomiting of the early months of pregnancy. Whenever in a gravid woman fever occurs, the cause for which is not exactly plain, and there is even very slight pain on pressure at the costovertebral angle on one side, it is well to suspect colon bacillus infection of the kidney pelvis as the trouble present, and search for it in the urine obtained by ureteral catheterization. In these cases there may or may not be a leukocytosis. If there is, it is never very high.

TREATMENT

An attention to the prodromes, ureteral catheterization and lavage will often abort an attack. Rest in bed, a milk diet and diuresis are necessary. If the child has a right lateral position, have the woman lie on the left side, and vice versa. Salol should be given in large doses. If these simple measures do not succeed, ureteral catheterization with lavage often will. The use of autogenous vaccines and, in persistent cases, a retained ureteral catheter should be tried. If the febrile symptoms do not then abate or the vomiting cease, choose between induced labor or a surgical operation, which should be nephrotomy or nephrectomy according to the condition of the affected kidney as indicated by the functional tests and by its appearance and feel at the time of operation. The prognosis is usually good for the mother as to life, but not good as to the production of a permanent cure without surgical interference. It is always bad for the child. In general, induction of premature labor is advisable, unless some special indications exist for not doing so, because the symptoms usually disappear very rapidly after the emptying of the uterus; if they do not, then nephrotomy or nephrectomy is to be resorted to. If nephrotomy is done the kidney should be sewed to the edge of the wound in the lumbar muscles and a thin, soft, pure rubber drain introduced into its pelvis and the kidney irrigated through and through by means of a ureteral catheter every two or three days with a solution of silver nitrate, mercuric oxycyanid or aluminum acetate.

A pyelitis due to any other infective organism should be treated in the same manner. In cases of multiple abscesses, pyonephrosis, it is better to do a nephrectomy primarily.

TUBERCULOSIS

Renal tuberculosis is a progressive infection, slow in its development, often remittent, probably incurable by medical means, due to the deposit of the bacillus of Koch within the tissues of the kidney by the blood-stream and perhaps sometimes by way of the lymph-channels.

It presents different types: First, the miliary form, distinguished by the deposit in the cortex of widely disseminated foci of granulation tissue containing tubercle bacilli; a complication of advanced pulmonary tuberculosis or a part of a general tuberculosis and having no diagnostic symptoms beyond the occasionally suspicious occurrence of renal hemorrhage or albuminuria and infiltration and irritation of the mucous membrane about the mouths of the ureters.

Second, a chronic parenchymatous nephritis with abundant albuminuria, scanty urine and dropsical effusions, without cardiac hypertrophy, and without increased arterial pressure. This occurs occasionally in the later stages of pulmonary tuberculosis and is of rapid development; the urine is irritating to the trigon, the bacillus cannot often be found, but guinea-pig inoculations are usually positive.

Third, it is asserted by some writers that there exists a tuberculous interstitial nephritis.

Fourth, and most important, is the form characterized by a slow infiltration of the parenchyma with minute foci of infection which tend to join with each other, forming circumscribed nodules or masses that soften or ulcerate and undergo caseous degeneration. Fortunately this process is at the beginning almost invariably unilateral, and occurs as a rule in persons who are not affected with active tuberculosis, but have lesions that appear to be cured, or present no evidence of tuberculosis. This is at the same time the most hopeful and the least hopeful of tuberculous changes in the kidney, and is the one usually meant when renal tuberculosis is spoken of.

SYMPTOMS

At its commencement there is no symptom or group of symptoms that is diagnostic. The first of all is vesical irritability, soon followed by the appearance of albumin in the urine and perhaps hematuria. The cystalgia is apt to be disregarded for a long time, the albumin to remain undiscovered until a free renal hemorrhage alarms the victim and sends him to the physician. Even then most generally the significance of the syndrome is not understood. Renal stone is a rare disease, renal tuberculosis a common one, yet the average consultant will search diligently for the calculus that is not there and forget all about the tuberculosis that is. The presence of pus in the urine is not long delayed and with it the agent of the process, the bacillus of Koch, appears.

It is important that the exact significance of this picture should be appreciated by every physician. Be suspicious of every case of prolonged vesical irritability the origin of which is not entirely clear, for therein a renal tuberculosis may be ambushed—a chronic infection, slow in its development, progressive, involving finally the entire urinary system, and mercilessly fatal—more important by reason of the fact that from its anatomic peculiarity early skilful surgical aid will effect a permanent cure in more than 50 per cent. of the cases.

MODE OF INFECTION

How does the bacillus invade the kidney? By the blood-stream in all but the rarest of instances; the process is exactly the same as that which takes place in the other hemic infections. When open tuberculosis, patent to the dullest clinician, active pulmonary lesions, joint or bone affections, or degenerations of the genital organs are present, the source of infection is so plain that no mistake can be made. Much more often a nidus of walled-in bacilli, the remnant of an infection of childhood, unheeded or unsuspected, exists in the lymph-nodes of the mediastinum or the neck; and under the depressing influence of trauma, acute inflammatory disease of neighboring parts, or impoverishment of blood following vigil, or overwork or overplay in vitiated air, softening of the caseated gland takes place, discharging sparse bacilli into the blood-stream attached to tiny fat droplets or tissue shreds, minute emboli of such low vitality that when arrested in the capillaries of an injured or diseased kidney they colonize slowly and without vigor, producing a form of renal tuberculosis which is from the onset essentially chronic, the clinical form which is the most important—that now under consideration—unilateral, nodular, caseating renal tuberculosis.

Why tuberculosis of any of the paired organs should almost invariably at the start be unilateral is difficult to explain, but it is a clinical condition of universal observation and this form of tuberculosis of the kidney is no exception to the rule; fully 85 per cent. of the cases are unilateral at the outset. It is this very anatomic peculiarity which renders them hopeful subjects for surgical therapeusis. If given time enough for development each one of these cases will eventually become bilateral infections and when they do it is too late to consider a cure by surgical interference. How long a time does this take? This varies with the virulence of the infection and the resistance of the patient. When it does occur are the bacilli derived from the original nest from which the first kidney was infected or is their source the diseased kidney itself? The researches of Israel on the rarity or banality of infection of the remaining kidney after nephrectomy for this disease give the answer of this question, for they show conclusively that the presence of a tuberculous kidney in the body of a person predisposed to tuberculosis is a greater danger to its healthy fellow than the presence of infective foci elsewhere.

It is interesting to watch these patients year after year when operation is refused. The great majority of them present an infection of the second kidney within three years and only about 20 per cent. of them live beyond the fifth year. In a few the disease appears for a long time to be really benign, the hemorrhages cease, the urine clears up, the vesical symptoms ameliorate and almost or entirely disappear, there is no inconvenience, the cystoscopic picture becomes almost normal, no tubercle bacilli can be found and even the guinea-pig test may be negative. This apparent cure is not accomplished at once but slowly, and to any agent that may have been administered or to any medical cult that may have been employed, a cure is credited. But, alas, these cures are but frauds; they do not exist; it is only the segregation of the infected focus that has taken place; firmly walled off from the sound kidney structures by inflammatory tissue which for the time being is sufficient barrier to their extension, and cut off from the urinary stream by the automatic ligation of the calix or calices of the diseased portions of the kidney, or perhaps the side-tracking of the entire kidney by the stenosis of its ureter, the bacilli sleep peacefully in their cheesy storehouse until constitutional disease or trauma or renewed activity once more liberates them. However long the interval of inactivity may be, the post-mortem table never shows these cases as cured. Once started, the

disease is subject to many remissions but never disappears. The pity is that when we encounter a case there is no way to tell whether its progress will be slow or rapid; we only know that left to itself it in time will be fatal.

The kidney does not present on section the same appearance in all of these cases, but one is always impressed by the pathology of its incurability. Occasionally one finds calcified lesions but always with active nodules beside them; just as rare are perfect cicatrices indicating fibroid healing of a nodule, for beside or within them active foci can be found. The whole kidney, or one pole, becoming a cheesy cavern, often breaks down and is discharged through the ureter; but its walls, filled with purulent urine, are always covered with tuberculous granulations. Even the clear contents of the cysts found in excluded kidneys is fatal to guinea-pigs.

Of all the chronic infections to which the human body is subject, tuberculosis is the most kind. Judging from the experience of the operating room and the section room and the medical clinic, the enormous majority of those attacked by tuberculosis of the lungs, bones, lymph-glands, skin, etc., recover. Then why does not the kidney get well? Perhaps it does in the miliary forms and in tuberculous nephritis, but not in the caseous forms. There are two plausible reasons for this. The first is the universal tendency to destruction of the kidney tissue by the caseous degeneration, and the other the continued interference with the circulation of the organ and the retention in it of the urine loaded with tubercle bacilli, caused by the infection of the walls of the ureter and its obstruction by the inflammatory processes engendered thereby.

DIAGNOSIS

Recognition is easy to the instructed; very common, yet the medical profession in general never diagnoses more than one out of five of these cases until the kidney is practically destroyed. In addition to the existence of vesical irritability, pus, tubercle bacilli and perhaps blood will be found in the urine obtained by a sterile ureteral catheter from the pelvis of a suspected kidney. The patient should have a liberal quantity of water for at least two hours before the catheterization, and the urine should be collected for at least one hour. If acid-fast bacilli are not found or very few, or only spores are found after prolonged centrifugal sedimentation, the sediment should be injected into a guinea-pig, or the complement fixation test of Debré and Paraf, which consists of the demonstration of a tuberculous antigen in the urine, should be applied.

To an expert in cystoscopy the diagnosis may be surmised with an almost positive certainty from the presence of a peculiar injected appearance of the mucous membrane of the trigon which looks as if finely powdered paprika were blown with great force into it. There is also edema and not infrequently ulceration of the mucous membrane within and about the trigon and at the vesical neck. There is no distinct diagnostic appearance of the ureteral meatus, for this may be concealed in a mass of granulation tissue, deformed and constricted by ulceration, or lie open like a golf hole, or be only slightly puffed by the irritation of the bacterins. The chromogenetic functional tests aid only in determining the secretory capacity of the kidney without indicating the cause of its depressed function.

If the edema or ulceration of the trigon or stenosis of the ureter makes it impossible to catheterize the ureters, exploratory examination of each kidney should be made to determine which is the diseased one. We cannot be too strongly reminded of the fact that we must distrust the evidences of a tumor of the loin discovered by palpation when we are seeking the diseased kidney. The mass may be only a hypertrophied healthy kidney or it may be the sole functionating one also not free from disease. Each kidney should be brought from its bed on to the loin and its entire surface, and more particularly its pelvis and its ureter, viewed and palpated for pathologic changes. A diseased ureter will be thickened and adherent. The fatty capsule about a diseased kidney will be adherent in places to the true capsule, sometimes so intimately associated with it that it is impossible to separate them. In case of doubt it may be necessary to open both ureters some distance from the kidney and obtain a specimen of urine from them for microscopic examination before deciding which kidney is the diseased one.

Having made our diagnosis and ascertained the prognosis in the special case, what are we to recommend to our patient? There are but two ways of treating him, either by the general treatment for tuberculosis: climatic and hygienic measures combined with diet, drugs of the creosote class, and tuberculin; or we must subject him to surgical exclusion of the diseased kidney, nephrectomy. The combined work of many skilled urologic surgeons in all parts of the world during the past ten years has demonstrated that the only way to cure a kidney affected with unilateral nodular, caseous tuberculosis is nephrectomy.

It results in the immediate relief of 75 per cent. of the cases and in the permanent cure of 50 per cent. of them. If the surgeon is skilled in this class of operations, the immediate mortality should not exceed 6 per cent., and is for some as low as 1 per cent. The natural history of the disease shows that though remissions are many the progress is always relentless, eventually ending in death; but before the advent of the lethal day the diseased kidney invariably infects its fellow; and when the patient does not go out by reason of his renal tuberculosis he dies of tuberculosis of other organs. If the disease is far advanced and both kidneys are tuberculous, if one causes great distress and the other shows sufficient functional capacity to carry the burden of life, the less normal one should be removed. This operation is of course palliative only, for death usually takes place in the first year after operation.

Nephrotomy is not curative and should be resorted to only in distinctly suppurating cases, especially when the process has become perinephritic and when the general condition of the patient will be improved by temporary drainage awaiting a nephrectomy, to be done as soon as it is safe.

I find that it is not the explanation of the percentage of permanent cures resulting from the removal of the diseased kidney that moves many to submit to nephrectomy, but it is the atrocious and almost continual pain in the bladder that drives them to it in desperation, and usually the early stage has passed when this occurs. I very often have had the opposition of the medical adviser, for a large percentage of the older practitioners of medicine are skeptical about the existence of renal tuberculosis or are fearful of the results

of operation, or believe that the patient can be cured by medical means.

"To prevent disappointment it is best to look on tuberculin as of assistance in the treatment of tuberculosis of the kidney and not as a specific remedy therefor." In forming an opinion of its value we must use as a base the reports of those who have had the patience to use it, over long periods of time, in numerous cases that have answered to the requirements of a perfect diagnosis: the direct demonstration of tubercle bacilli in an acid purulent urine received in a sterile container from a sterile ureteral catheter introduced into the pelvis of the kidney of a person afflicted with polyuria, dysuria or both; or the development in a guinea-pig inoculated with the sediment of this urine, of tuberculosis at the point of inoculation.

The evidence of experienced operators, who have frequently nephrectomized such patients with a low mortality both immediate and remote, yet who have had the courage thoroughly to test out the merits of tuberculin, is the best evidence of all, for they know and appreciate better than others the unreliable history of the disease and its unaccountable vagaries—how the individual develops a marked resistance to reinfection both from within and without, accounting for the slow progress of renal tuberculosis, its remissions of disturbing symptoms, and sometimes of apparent cure for months and for years, by the encapsulation and sealing up of the abscess cavity, thus introducing an element of doubt always into the origin of any favorable results following the use of tuberculin. Its use as a remedy in tuberculosis of the kidney can never be other than empirical. Many who have sung the praises of its curative powers have not always been very careful to make sure that their cases were tuberculosis of the kidney and were satisfied to report a cure when their patients increased in weight and the vesical symptoms decreased in intensity. There is no case on record that I have been able to find, that answers the full requirements of a cure of tuberculosis of the kidney by tuberculin; and yet there are many intelligent urologic surgeons who believe that it is possible if the disease is recognized early that it may be cured by hygienic and climatic measures if aided by tuberculin, and all agree that it is at least a useful placebo in bilateral renal tuberculosis, and in those cases in which one kidney having been removed the remaining one is attacked by the bacillus. Firmly convinced that in unilateral nodular caseous tuberculosis of the kidney, in the presence of a sound companion and without the existence of any other contraindication thereto, nephrectomy is the only remedy that promises a permanent cure, I have found it very difficult to convince the sick man and his friends of the benignancy of the operation in skilled hands and the necessity therefor, and so have been compelled to treat very many cases against my judgment as what was best, by tuberculin, duotal and hygienic measures. The clinical results in a few instances have been astonishing and in many fairly satisfactory, and were it not for the inexorable average history of unilateral tuberculosis of the kidney, did we not know that the walled-in abscess may contain living bacilli that hibernate for years only to be released by some mechanical insult or some lowered resistance giving rise to metastatic autoinfection again, I might well believe I had seen cures effected by tuberculin.

It is not a matter of much importance what particular preparation of tuberculin is used. The Belgians, and many of the French, use Deny's B. F. In Germany and America Koch's O. T. and N. T. and B. E. are in most general use.

The dose, however, is not a matter of indifference. It should be be small, always very small, at first. One that will equal from 1:1,000,000 to 1:100,000 mg. of O. T. is always sufficient to start with and it should be raised very gradually, avoiding the occasioning of a local or general reaction. The intervals of its administration should be four or five days. Used in this way it helps many and injures none.

Lissner Building.

ACUTE UNILATERAL HEMATOGENOUS INFECTIONS OF THE KIDNEY*

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At the meeting of the American Association of Genito-Urinary Surgeons in June, 1912, I reported a series of cases of acute unilateral hematogenous infection of the kidney, some treated by nephrectomy, others by decapsulation or drainage, and another group by non-surgical measures.

At this time it is my desire to relate the subsequent course of these patients and to refer to others which have come under my observation since that time. Tuberculosis, the most common of all hemic infection of the kidney, is not to be considered.

Suppuration within the kidney parenchyma, as is well known, results from infection by one or another of certain varieties of micro-organisms taking place usually in one or two ways, either as an ascending infective process from the lower urinary tract or brought to the kidney by the blood stream; yet rarely the kidney becomes acutely infected by adjacent septic foci or by penetrating wounds.

Ascending kidney infection is not the subject under consideration, and will not be considered, yet it must be stated that it is quite impossible in some instances of *Bacillus coli* infection of the kidney, to be certain that its origin is hemic and not ascending.

The acute renal infections of hematogenous origin are of two distinct classes: one induced by infective or toxemic conditions, for example, nearly all of the infections which give rise to general diseases such as diphtheria, scarlet fever, measles, small-pox, pneumonia, typhoid fever, etc. The disturbance within the kidney is due, in this class, to the action of toxic substances elaborated by the virus of the special disease which is in part eliminated through the kidneys. While the toxic substances of these acute general diseases conveyed to the kidney by the blood stream induce cellular necrosis, it is rare that suppuration occurs, and this type of hematogenous kidney disturbance remains medical rather than surgical.

It is the second, rather smaller, yet more serious, class of kidney infection of hematogenous origin, whereby the kidney is invaded by the micro-organisms themselves, resulting in acute inflammation and suppuration, that commands our attention from a surgical standpoint.

Acute suppurative nephritis of hematogenous origin is a condition resulting from the invasion of the kidney by certain micro-organisms, in particular by the

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pyogenic cocci and the colon bacillus. It is theoretically of a metastatic nature, and when encountered in both kidneys is usually consecutive to septic endocarditis or other septic affections elsewhere in the body. When it occurs in but one of the two kidneys the primary focus from which the organisms find their way to the kidney has seldom been determined; yet there are some instances in which acute tonsillitis, osteomyelitis and similar acute diseases of pyogenic origin may be correlated with an acute hemic infection of the kidney. Israel feels that he has been able to trace such renal infections to such simple infections as furuncles and paronychia.

PATHOLOGY

The pathology of acute unilateral hematogenous infections of the kidney is quite different from the acute bilateral kidney infections. The latter are an expression of a general septicemia or pyemia in which the kidneys participate. The former, the acute unilateral kidney infections of hematogenous origin, are not a part of general pyemia, but find their origin in the lodging of a minute embolus carrying one or several organisms in the terminal vessels of the kidney. It is believed that the process may be started by a single micro-organism.

The condition starts not by multiple simultaneous points of infections throughout the kidney, as the lesions observed in the kidneys removed at operation might suggest, but as a single focus in the cortex of the organ. When the organisms settle in the minute capillary vessels of the glomerulus, an inflammatory reaction is set up around the glomerulus, and the surrounding tissue is infiltrated with the products of inflammation. From the primary focus of the infection other areas are secondarily involved by the infectious material gaining access to other tubules, to the lymph spaces and through the vessels in the connective tissue stroma. The infection thus is more or less rapidly spread through these channels to other parts of the organ.

The pathologic process originating as described above is of two distinct types: (1) *abscess formation*, and (2) *a diffuse inflammatory process without breaking down of tissue.*

In the former type of the disease, *abscess formation*, the kidney is found somewhat enlarged from congestion, and disseminated through its substance are small separate foci of suppuration or miliary abscesses surrounded by areas of congestion. In the early stages of the disease these minute abscesses are often observed in the cortex just beneath the capsule. From here other parts of the organ are secondarily involved, as just mentioned. If the process continues, these foci may enlarge, coalesce and form abscesses of larger size which may rupture the kidney capsule, and invade the perirenal fat, resulting in a perinephritic abscess. For the infection to complete this cycle, the resistance of the individual must be great and the virulence of the infecting organisms comparatively slight, as the systemic toxemia from this disease is rapid and death usually occurs before the process develops to this stage. The organisms producing this form of kidney inflammation are the pyogenic cocci, the *Staphylococcus pyogenes albus* and *aureus*, and the *Streptococcus pyogenes.*

The second type of the disease, *a diffuse inflammatory process spreading through the kidney substances, but not resulting in focal abscesses or solution of tissue*, has the same sequence of events in its pathology when of hematogenous origin. This type of the disease presents a pathologic condition more commonly the result of an ascending infection, but is encountered as a process of hematogenous origin and results not from an infection of the organ by the pyogenic cocci, as does the abscess type, but by the colon bacillus.

The difference in the severity of the process depends on the lesser virulence of the infecting organisms. The organ is found to be enlarged from congestion. There may be subcapsular areas of more or less acute reddening, and on section the organ is found presenting irregular, circumscribed, acutely reddened or pale yellowish areas involving the cortex and pyramids or involving nearly the whole organ, but without solution of tissue. In the early stage of the process these isolated areas are distinct and are seen as irregular, acutely reddened patches with the edges streaked downward into the pyramids. As the inflammatory process subsides, these areas lose the acute red color and are replaced by tissue of a paler character. In some instances the whole kidney may present an acutely reddened surface, owing to the acute process involving the whole organ. This form of the disease undergoes resolution without focal degeneration of tissues, and when seen after the acute process has subsided, presents paler areas, dependent on the stage of the connective tissue repair process.

By studying the clinical course of these two forms of the disease, it becomes evident that the clinical signs differ in some respects, and each has a definite relation with these two different pathologic conditions. The subjective and objective signs which the patient presents should suggest the type of process at work in the affected kidney, and these two types of infection should be recognized on inspection of the diseased organ at the time of operation, for experience has shown that these different types of infection do not require the same form of treatment. While the kidney containing numerous focal abscesses requires nephrectomy, less radical measures suffice in the diffuse, non-suppurative form of infection.

From the *clinical aspect* of the subject the picture which *unilateral multiple abscess formation* produces is an acute disease which may or may not be ushered in by chill. There is a rapid rise of temperature to from 102 to 105 F., and an early acceleration of pulse rate usually to 120 or higher, occurring often within twenty-four hours following the onset. Sepsis or toxemia and a high leukocytosis develop rapidly. Pain on the side of the affected organ, abdominal tenderness, muscular rigidity and spasm are found on the affected side. Lumbar tenderness, rigidity and spasm are pathognomonic signs of the disease. The abdominal signs are similar to those occurring in acute affection of the appendix and gall-bladder, for which this disease of the kidney is often, if not usually, mistaken. Unfortunately, the urine in this disease does not excite suspicion of the true condition, as it is usually quite normal in its gross and microscopic appearance, and genearlly contains but little albumin and only a small amount of pus and blood-cells, because the abscesses find no avenue of escape through the collecting tubules, which are either plugged by the product of inflammation or compressed by the infiltrated tissue surrounding them.

When the infection is severe, the patient grows progressively and rapidly worse, the toxemia becomes profound, delirium sets in and there is a fatal termination within a few days unless the body is rid of the

infected organ. Of this form of the disease I have observed five cases. The following cases illustrate this type of the disease:

CASE 1.—Woman, aged 38, entered the gynecologic service of the Boston City Hospital under the care of Dr. Franklin Newell and Dr. Ernest Young, March 27, 1912. The past history was negative, with the exception that one year ago both tubes, ovaries and appendix were removed for acute inflammation. The present illness was characterized by severe pains in the right kidney region, chills, fever and vomiting beginning three days before entrance and gradually increasing in severity. The temperature at entrance was 103.4 and the pulse 120, leukocytosis 28,000. The general condition of the patient gave every evidence of good health prior to the onset of the present illness. The physical examination showed a flushed face, throat and lungs negative, anemic murmur in the heart. The abdomen was not distended, but showed marked tenderness in the right side, less so on the left. Exquisite tenderness in the right upper quadrant and in the right loin. There was rigidity and spasm of the right rectus and lumbar spasms. Vaginal examination was negative. The urine was turbid, 1.020, acid, slight trace of albumin, no sugar or bile. The sediment was small in amount and consisted of pus, an occasional blood corpuscle and epithelial cell. The patient's condition became progressively worse during the following two days, and on the third day after entrance (six days after onset of the trouble) was extremely bad. At this time I saw the patient in consultation with Dr. Young. Her appearance was that of profound sepsis, pulse 130 of poor quality, temperature 103. There was a rigidity of the right side of the abdomen, with marked tenderness over the right kidney in front and in back. The urine at this time was only turbid and contained little pus. The leukocytosis was 18,000. An operation was advised as the only chance for life, although the risk was considered great.

A lumbar incision was made, the perinephritic fat found infiltrated with cloudy serum but no pus. The kidney was exposed and delivered. It was twice normal size, congested, and over the surface were scattered many focal abscesses from 1 to 5 mm. in diameter. The pedicle was clamped and the kidney removed. No attempt was made to tie the pedicle on account of the poor condition of the patient, stimulation and salt solution being required during the operation. The clamp was left on the pedicle; the wound drained by a spiral tube with gauze and the wound partially closed.

Twenty-four hours after operation the patient's temperature dropped to 100 and the pulse to 110. The improvement in appearance and general condition was perceptible. The clamp was removed from the kidney pedicle on the sixth day. The patient made an uneventful recovery.

The pathologic report was acute inflammation of the kidney, with multiple miliary abscesses from which *Staphylococcus pyogenes* was recovered.

Two years after operation this patient is living and well.

CASE 2.—Woman, aged 32, seen in consultation with Dr. Albert Griffiths and Dr. Nathaniel Thayer at the Swedish Hospital, Brooklyn, Sept. 27, 1907. Previous health had been excellent. For two days the patient had complained of pain in right kidney region. There had been a chill, rise of temperature to 103, and urine was cloudy, containing 0.25 per cent. albumin and considerable sediment, consisting of pus, normal and abnormal blood, but no casts. The pain became more severe, and her general condition failed rapidly. When seen by me the general condition was poor, temperature 103.5, pulse 108, and urine as mentioned above. There was tenderness over the whole right side of the abdomen, rigidity and spasm of the right rectus. There was exquisite lumbar tenderness with spasm. The kidney was approached through a lumbar incision, the perirenal fat found to be edematous and adherent to the kidney capsule in the central third of the organ. The kidney when freed and delivered was found to be about one-third larger than normal and much congested. In the middle quarter an area about 1½ inches in length, of irregular surface, slightly harder than normal was found. This area extended over the anterior and posterior surfaces of the kidney to within about ¼ inch of the renal pelvis. The kidney was split in the convex border and the area observed on the surface was found to involve the central quarter of the kidney down to the renal pelvis. This area, darker than the surrounding tissue, contained several small foci of purulent material from 1 to 4 mm. in diameter. The remainder of the kidney showed only congestion. A wedged-shaped piece including the central third of the kidney and passing about ½ inch outside the infected area was resected. The upper and lower remaining thirds of the kidney were then brought together by mattress sutures. The wound was united around a tube and gage drain. The temperature dropped to normal on the second day following operation, and the abnormal elements disappeared from the urine. The patient left the hospital fifteen days after the operation with a small, clean, granulating wound. The improvement in general condition was rapid.

The pathologic report showed acute inflammation with multiple abscess formation. Staphylococci were demonstrated in the section, but the organism was not isolated. Dr. Griffiths reports that the patient has continued in good health since the operation (Sept. 27, 1907), now six years and nine months.

CASE 3.—Woman, aged 34, presented the following clinical history: About five months ago she had an illness characterized by fever, pain in right side of abdomen and back. It was considered appendicitis by the attending physician. Remained in bed two weeks, at which time the symptoms had disappeared. An indefinite pain remained in right kidney region, more noticeable after physical exertion. Three months ago had a similar acute attack.

Aug. 1, 1906, the patient was again taken acutely ill, and when seen by me had a temperature of 101.8, pulse 110, and a leukocytosis of 18,000. The urine was negative except for a slight trace of albumin and a few pus and blood cells. There was severe pain in the right hypochondrium and acute tenderness and rigidity over the right rectus and in the right costovertebral angle. The appendix region was negative. During the following two days the temperature rose to 104, pulse to 120 and white count to 22,000. The urine remained the same. The pain, tenderness and rigidity became more marked and the patient began to look toxic. The diagnosis of acute inflammation of the kidney was made. The kidney was approached through a lumbar incision, the perirenal fat found edematous and the kidney about one-third larger than normal. Beneath the capsule were many small miliary abscesses. The pedicle was clamped and the kidney removed. The pedicle was tied and the wound closed with drainage. Within two days the temperature and pulse had fallen to normal and the general condition of the patient was much improved. The pathologic report was acute inflammation of the kidney with abscess formation with areas of scar tissue.

This case is of special interest because of the presence in the kidney of areas of scar tissue which may be correlated with the previous attack of illness with renal symptoms, as related in the history, and suggests that resolution of an infection of this type may take place.

CASE 4.—Woman, aged 38, had had excellent health. Four days ago she was taken suddenly with severe pain in the right upper quadrant of the abdomen, accompanied by vomiting. She felt feverish and had several chills. When seen by me, Nov. 15, 1908, the temperature was 102.4, pulse 108, white count 17,200. In the costovertebral angle exquisite tenderness and marked muscular rigidity. In the right hypochondrium there was marked tenderness and rigidity, suggesting gall-bladder disease. Urine of high color, no bile, 1.014, acid, with a trace of albumin. The sediment was small in amount and contained many leukocytes, rare normal and abnormal blood-cells, hyaline and brown casts, occasionally fatty renal cells, and a few squamous epithelial cells. The patient remained in this condition without much change for four days, when it became evident that the toxemia was becoming pronounced, and the signs in the costovertebral

region accentuated. The kidney was approached through the lumbar region, the perirenal fat found edematous, the kidney somewhat enlarged, and beneath the capsule could be seen many discrete abscesses about 2 to 4 mm. in diameter. A nephrectomy was performed, the pedicle tied, the wound drained; the temperature and pulse fell to normal on the third day; the abnormal elements disappeared from the urine except for the presence of epithelial cells. The pathologic report was acute inflammation of the kidney with abscess formation.

The patient was last seen in 1910 (four years after operation). At that time she was well, had gained in weight and considered her general condition better than it had been for years.

CASE 5.—Boy, aged 17. Past history negative except severe tonsillitis seven days ago. Abdominal symptoms suggesting the peritonitis sometimes associated with tonsillitis appeared three days before patient was seen by me (Sept. 10, 1911). At that time the patient was acutely ill; temperature 103, pulse 110. White count 22,000. The tonsils were still acutely inflamed. There was tenderness over the whole abdomen and spasm on the right side. There was tenderness in the costovertebral space on the right. Urine 1.024, high, a large trace of albumin; a small amount of sediment, consisting of blood, large and small round cells and a few pus cells and granular casts. While the patient had been severely ill with tonsillitis from the onset, the attending physician believed the patient to be much more toxic since the onset of the abdominal symptoms. The patient was in a critical condition and it was believed that the right kidney had become acutely infected.

The right kidney was exposed through the loin. The perirenal fat was edematous. The kidney was enlarged about one-third over normal, and scattered over its surface were numerous foci of suppuration from 2 to 5 mm. in diameter. The kidney pedicle was clamped and tied, and the kidney removed. The wound was closed with drainage.

The pathologic diagnosis was acute inflammation of the kidney with abscess formation. The *Staphylococcus albus* and the *Streptococcus pyogenes* were found.

There was considerable improvement in the patient's condition during the following twenty-four hours, but he remained critically ill for ten days, when the temperature then reached normal. At this time the tonsillitis had subsided and the patient made a slow but uneventful recovery. Two years and six months after operation the patient was in excellent condition.

The *clinical picture produced by a diffuse inflammatory process within the kidney without abscess formation* differs from that with abscess formation chiefly in the severity of the symptoms and is the type of the disease most usually due to *Bacillus coli* infection and most difficult to distinguish from an ascending infection. The onset may be sudden, as in the former type, with acceleration of the pulse rate; and a leukocytosis is always present, often high. A chill may accompany the onset. Pain in the loin on the affected side is an early symptom, sometimes indefinite but often severe, varying according to the severity of the process. Tenderness over the kidney in the costovertebral angle, with some muscular rigidity and abdominal tenderness and rigidity on the affected side, is a constant sign. The chief feature differentiating this form of the disease from that of abscess formation is the lesser degree of progressive toxemia and the presence of more abnormal elements in the urine. These patients, while acutely ill, do not have the very severe and rapidly progressive toxic course which characterizes the other form of the disease. The illness after the first few days following the onset remains more or less stationary and may continue not unlike a beginning typhoid fever. The pain, tenderness and muscle rigidity may become gradually more pronounced, and the temperature, pulse and leukocytosis elevated, or the different signs may gradually decline. Remissions in the acute symptoms occur, but indefinite pain on the affected side usually persists indefinitely, and recurrences of the acute symptoms are not uncommon. The following cases are illustrative of this type of the disease:

CASE 6.—Woman, aged 24, gave a history of syphilis four years ago. Treated with mercury continuously for three years. Jan. 7, 1910, laparotomy was performed by another surgeon because of severe pain on the right side of the abdomen, associated with spasm and tenderness over the right rectus muscle. At this time the temperature was 102.5. A few small cysts of the right ovary and a normal appendix were removed. A thorough exploration of the remaining abdominal organs proved negative. Following operation the pain in the right side persisted, the temperature ranged between 101 and 104, and the pulse around 120. The white count was 14,000. This condition persisted for about one week, when the temperature returned to normal, the pulse to 100, and the tenderness became much less.

One week later the pain again became severe, the temperature rose to 102, and the right side of the abdomen and back became very tender. Examination showed marked tenderness and involuntary spasm over the right side of the abdomen and back. White count was 23,000. The patient remained in this condition for about one week, when symptoms gradually subsided. The urine at this time showed but a trace of albumin, a small amount of pus, single and in clumps. A few small round cells and granular casts.

Two weeks later another acute attack of pain on the right side. Temperature rose to 102, pulse to 120. The twenty-four hour amount of urine at this time was 550 c.c. The sediment showed more pus, many small, round epithelial cells and a few hyaline and granular casts. Roentgen-ray examination was negative.

I first saw the patient in this attack. At this time there was general abdominal tenderness and spasm more marked over the right side. There was exquisite tenderness and spasm in the right costovertebral space. The general condition was only fair. The patient looked septic. The diagnosis of acute inflammation of the kidney was entertained.

An anterior incision was made, the peritoneum opened, the abdomen explored and found to be negative. The anterior incision was closed. The kidney was then approached through the loin. The perirenal fat was found adherent to the kidney and a hard nodule about the size of a Concord grape situated in the perirenal fat was removed. The kidney was slightly larger than normal and showed many red areas beneath the capsule. On section of the organ, similar areas were found scattered through the kidney substance. Nephrectomy was performed, the pedicle tied and the wound drained.

Four days following the nephrectomy the patient developed a right lobar pneumonia which a few days later involved the left side, and death occurred eleven days after operation. The wound at this time had healed except for a small granulating area.

The pathologic report showed acute inflammation of the kidney, with several areas showing connective tissue repair. The *Bacillus coli* was recovered from the tissues.

CASE 7.—Man, aged 31, seen in consultation with Dr. Richard Collins at the Waltham Hospital, Jan. 25, 1910, since childhood has had a chronic discharge from the right ear. About ten years ago he had a severe attack of pain in the right kidney region, the facts regarding which are indefinite. Five years ago he had a similar attack and passed a small amount of blood in urine. He was confined to the bed for a short time. Four years ago he had a similar attack associated with fever, and frequent urination, and passed small amounts of blood in the urine several times.

Five days ago, after a hearty dinner, patient had a severe attack of pain in right side, associated with a chill and vomiting. He was then admitted to the Waltham Hospital, acutely ill, with pain on right side, temperature 102, pulse 104.

Acute symptoms gradually subsided, but pain in the back persisted. Roentgen-ray examination was negative. He was seen by me, Feb. 25, 1910. The patient's condition was as noted above. A cystoscopy performed at this time showed the bladder urine to be slightly cloudy and containing shreds. This urine was 1.020 in specific gravity, acid, and the sediment showed considerable pus, small round and many squamous epithelial cells. There was considerable fresh blood. Trigon was normal. Both ureteral orifices were normal in size and character. About ¾ inch above the right ureteral orifice was seen a group of eight or ten acutely injected areas from which bleeding had taken place and on which were adherent blood-clots. These areas were a little larger than a pin, and resembled early tuberculosis of the bladder. The remainder of the bladder was normal. Both ureters were catheterized. The urine collected from the two was equal in amount. The examination of the urine from the left side showed little abnormal; from the right side considerable pus and normal blood-cells; a few caudate and small round cells. Guinea-pigs inoculated for tuberculosis did not develop the disease.

Jan. 29, 1910, an exploratory examination of the kidney was made on account of the persistent pain and cystoscopic findings. The kidney was exposed through the loin. The perirenal fat was but slightly adherent to the kidney. Kidney was delivered and found slightly larger than normal. Beneath the capsules were seen a few grayish-white, contracted areas and a few acutely red areas. There was nothing abnormal in the remainder of the kidney or kidney pelvis. The kidney was split in Brödel's line. There were two acutely reddened areas in the upper half of the kidney. Believing the persistent pain to be due to these contracted areas, the kidney was removed, the pedicle tied and the wound drained.

The temperature, which was 101.5 at the time of operation, dropped to normal within twenty-four hours. The wound healed by first intention.

The pathologic report was an acute, diffuse inflammation of the kidney, with healed areas. The colon bacillus and *Staphylococcus pyogenes aureus* were recovered from the tissues. When last heard of, about one year following operation, the patient was reported to be well.

CASE 8.—Woman, aged 43, seen in consultation with Dr. H. W. Barker and Dr. A. W. Tucker of Lynn; thirteen years ago had a severe illness, characterized by pain in the right side of abdomen and back, fever, chills and cloudy urine. She was in bed for several weeks. Since that time she had several similar attacks which confined her to bed for from two weeks to three months. The different physicians who have cared for her have considered that in these attacks she was suffering from "peritonitis." Some advised operation, which the patient refused. Between these attacks there has been a constant pain, varying in severity, in the left kidney region. Several Roentgen examinations have shown nothing abnormal. Four years ago the patient had a small amount of blood in the urine during one of these attacks. This occurred again two years ago. It never lasted more than a few days.

Feb. 2, 1912, the patient was cystoscoped by Dr. H. W. Baker and a collargol injection and roentgenogram were made of the left kidney. The cystoscopy showed the bladder to be normal in all respects, both ureteral orifices were normal, and the catheters were passed to each kidney. The specimen of urine collected showed that from the right side to be normal, and that from the left to contain a few leukocytes, normal red cells, and caudate epithelial cells. The capacity of the renal pelvis was 14 c.c. The roentgenogram of the injected kidney pelvis showed it to be normal. No shadow appeared in the control plate.

Feb. 14, 1912, I again cystoscoped the patient, and found the condition as previously stated. An injection of 6 mg. of phenolsulphonephthalein showed the dye to appear on the right side in six minutes; left in nine minutes. The total amount recovered in two hours was: right 25 per cent., left 10 per cent. On account of the persistent pain an exploratory examination of the kidney was undertaken. Temperature at the time of operation was 102.2, pulse 100, leukocytosis 8,100. The operation was performed Feb. 16, 1912. An anterior incision was made. The peritoneal cavity was opened and explored. Nothing abnormal was found. The peritoneum was closed and stripped toward the median line, exposing the left kidney retroperitoneally. The kidney was but little larger than normal, and several grayish depressed areas were seen beneath the capsules. On section there were many pale grayish, sclerotic areas, some near the cortex, others in the pyramid. The remainder of the kidney was reddish yellow, and there were acute red streaks near the apices of the pyramids.

In view of the history these sclerotic areas were considered to be old resolved foci of acute inflammation. It was believed that the persistent pain following the acute attack was probably to be explained by these areas, and the kidney was therefore removed. The fat about the pedicle was adherent to the vessels, and as they could not be cleaned the pedicle was clamped and the wound closed about the clamp, which was removed on the fourth day. The patient made an uneventful recovery except for an infection which took place in the wound.

Pathologic report is as follows: The surface presents several opaque, grayish areas which are depressed and contracted. Some of these areas are surrounded by a small area of injection, irregular in outline. On section several similar but smaller opaque areas not surrounded by areas of injection are seen scattered throughout the kidney substance. Near the upper pole is seen an area 2 cm. in diameter, symmetrical and definite in outline, containing another area which is apparently a blood-clot. The capsule of the kidney strips easily, leaving a red surface in places. Cortex measures 6 mm., and glomeruli are distinct. Histologic diagnosis is acute, diffuse inflammation of the kidney, with healed areas.

Three months after operation the patient was in the best health which she had enjoyed for many years. She had gained 34 pounds in weight. Eight months after operation excellent health continues. Two years and four months after operation the patient is in excellent condition.

CASE 9.—Woman, aged 48, seen in consultation with Dr. H. Baker, March 2, 1912, presents a history of having had repeated attacks of pain in the left kidney region, associated with fever, chills and vomiting. These attacks confined her to bed for periods of weeks many times during the past five years. Since the first attack there has been constant pain in the left kidney region and during the past year the patient has been unable to lie down in bed and has been obliged to sleep sitting up on pillows. March 1, 1912, the patient was cystoscoped by Dr. Baker. The bladder was found to be normal. Both kidneys were cauterized. The urine obtained from the right side was acutely red and showed fresh blood, with a few squamous and large round cells. The fresh blood was believed to have been caused by the catheter. The urine of the left side was slightly cloudy and showed a few pus cells, single and in clumps, many squamous, polygonal and large round cells, many clumped with fat drops adherent.

The patient was seen by me, March 4, 1912. She was a poorly nourished woman, weighing 110 pounds, and complained of severe pain in the left kidney region. There was tenderness in the left costovertebral angle. The temperature was 99.4 and the pulse 108. As a result of the consultation it was decided that an exploratory operation of the kidney should be made.

March 10, 1912, the kidney was approached through an anterior incision, the peritoneal cavity opened and explored. Nothing abnormal was found. The peritoneal wound was closed and stripped toward the median line, exposing the kidney. The perirenal fat was slightly adherent to the kidney. This was freed and the kidney delivered. The organ was of normal size and rather pale. It was split in Brödel's line. The cut surface showed the tissue everywhere to be paler and firmer than normal, and there were no focal changes in the kidney tissue and the structure of the kidney was

normal, other than for its pale character. It was decided not to remove the organ. The capsule was stripped, the kidney fixed in position, and the wound entirely closed.

The patient made an uneventful recovery. The wound healed by first intention, and two months following operation there is but slight pain of the old character, which has continued to come only after unusual exertion. The urine still contains polygonal and large round cells with a small amount of fat. Six months after operation the old pain had entirely disappeared and the urine contained but a few squamous epithelial cells.

It is believed that the pathologic process present in this kidney was a connective tissue repair of a diffuse inflammation involving the whole kidney. The kidney was left in this patient as more or less of an experiment.

This patient has had much relief, yet there is pain of varying degree in the region of the affected kidney, most distressing when fatigued, or when the urine becomes much concentrated. The pain may be considered annoying rather than severe. The patient considers herself much benefited but not cured by the operation. The urine examined many times shows renal cells and occasional granular casts; a small but variable number of leukocytes and sometimes fat globules. Her present symptoms do not warrant nephrectomy.

Case 10.—Woman, aged 55, was operated on twelve years ago for carcinoma of the breast. Eleven years ago she had an attack of lobar pneumonia. She was admitted to the Long Island Hospital Feb. 19, 1914, complaining of pain in the pelvis with bloody discharge from vagina. Physical examination revealed the following defects: A diastolic murmur was heard at apex; not transmitted. Vaginal examination suggested carcinoma of the cervix, and a histologic examination of the tissue proved it to be carcinoma.

April 30, 1914, I performed an abdominal hysterectomy from which the patient made an uneventful recovery.

May 20, 1914, the patient's temperature rose to 102, white count 14,000. Urine showed the slightest possible trace of albumin, a few squamous large and small round cells and a few leukocytes. The patient continued to run a high temperature and pulse; became extremely sick and eight days after the onset when seen by me the urine had become cloudy with considerable pus. There was tenderness and spasm over the whole right side of the abdomen and the right kidney could be felt considerably enlarged and extremely tender in front and in the costovertebral angle. Temperature 102, pulse 120, respiration 30. The kidney was exposed through the loin; the perirenal fat was extremely edematous; the kidney was considerably enlarged and of a bluish tint. Organ incised; surface acutely reddened throughout, otherwise negative. A rubber drainage tube was placed into the kidney pelvis and the cut surface closed about it. The external wound was closed about the drainage tube. The *B. coli* was recovered from the kidney incision and from the urine. The temperature dropped to normal within thirty-six hours and the patient's condition now, two weeks after operation, is satisfactory in every way.

Case 11.—Boy, aged 19, referred by Dr. George Muttart, had negative past history, except that he had symptoms of acute appendicitis for three days. Appendectomy was performed by me July 23, 1912. Free cloudy fluid was found in the abdomen and pelvis, considerable in amount.. Abdomen and pelvis were drained. Patient made an uneventful recovery; wound healed on eighteenth day; on twentieth day following operation, the patient had a rise of temperature to 102 associated with a chill. The temperature continued to range between 101 and 103 for five days without other subjective signs except that there was indefinite pain in the right kidney region.

On the sixth day after onset of these symptoms there was marked tenderness in the right costovertebral angle and rigidity of the right rectus muscle. The urine for the first time became slightly cloudy and contained a trace of albumin and some blood and pus. A cystoscopic examination showed the bladder to be normal. The urine from the left kidney was normal, that from the right slightly cloudy, containing pus, blood and the colon bacillus. The patient was becoming progressively sicker, temperature 103, pulse 110.

The right kidney was exposed through the loin. The perirenal fat was filled with a cloudy serum, the kidney much enlarged and congested and beneath the capsule were seen many irregular areas of acute congestion. The kidney was split and these areas were found to be scattered through the kidney substances. A drainage tube was passed through the kidney into its pelvis and the kidney closed about the tube by mattress sutures. The external wound was closed about the drainage tube. The patient's temperature dropped to normal on the third day and the abnormal elements gradually disappeared from the urine. The patient is well almost two years following the operation.

During the past ten years I have seen seven patients in whom all signs pointed to a diffuse acute unilateral inflammatory process of the kidney, and in whom the symptoms subsided without operation. In four of these cases the colon bacillus was isolated from the affected kidney by means of the ureter catheter. The only sign of the disease remaining in these cases has been an indefinite pain in the region of the affected organ. In but one of these patients is this constant and in the others it may be considered absent, or present only during periods of fatigue. The urine in all shows but little abnormal. This type is illustrated by the following case, which is typical of this group:

Case 12.—Woman, aged 23, seen in consultation with Dr. A. L. Stavely and Dr. F. R. Hagner at Washington, D. C. Jan. 14, 1914, for many months had some indefinite feeling of discomfort in the right side, especially after playing golf, but no importance had been attached to it. January 8 she was seized with a severe pain on the right side of the abdomen, a chill and fever. The suspicion of appendicitis was entertained. When seen by Dr. Stavely her temperature was 102 and there was marked tenderness over the right kidney region associated with mucle spasm. Further examination showed a small amount of pus in the urine, a leukocytosis of 30,000 and the colon bacillus was isolated in culture from the urine. The patient became progressively sicker, the temperature ranging between 100 and 103. A cystoscopic examination by Dr. Hagner showed a distinct reddening of the whole bladder mucosa. The urine from the right ureter showed numerous epithelial cells and a moderate number of pus cells; the urine from the left kidney was normal. The kidney was injected with argyrol as it was thought that the patient might have a pyelitis. The temperature the following day (four days after onset) reached 104. The leukocytosis was 21,000; the polymorphonuclear leukocytes were 84.5 per cent. The patient's general condition was much worse and although the physical side had changed but little, the patient had become progressively more septic and the intoxication became alarming. When seen by me, six days following the onset, the patient's temperature had dropped to normal and the urine contained a considerable amount of pus for the first time. Physical examination was negative except for tenderness over the kidney region, in front and in the back, there being tenderness still existing in the costovertebral angle. The treatment, which had consisted of forced fluids and large doses of hexamethylenamin, were continued. The patient gradually improved and had no remissions of symptoms. At the present time, five months following the illness, the patient is in her usual health, although there is some indefinite discomfort in the right kidney region during fatigue. The urine is negative.

CONCLUSION

In the first class, the single kidney with multiple miliary abscess formation from which malignant toxemia results, the organ must be sacrificed in order to save the patient's life. In the second case of this class, mentioned in this report, only the central quarter

of the kidney was involved. While this infected area was completely removed by a resection of the middle third of the kidney, and the healthy upper and lower thirds united successfully and the outcome of the case was most favorable, this procedure must be considered hazardous and cannot be recommended. In the other four cases of this class, here recorded, nephrectomy was performed, and it is felt that in each instance it was the only means which could have saved the patient's life. All these patients are living to-day and are free from symptoms, considering themselves well.

While house surgeon at the Boston City Hospital, I observed two cases of this form of the disease: one in which Dr. Paul Thorndike did a nephrectomy followed by recovery, and one in which Dr. F. S. Watson did a nephrectomy with drainage followed by death from progressive toxemia.

The proper treatment in the second class, the type of diffuse acute, unilateral inflammation of the kidney, cannot be so clearly defined and must depend on the course of the disease in the individual case. As a broad rule, it is felt that palliation, forcing fluids and the employment of urinary antiseptics, fortifying the patient's strength by a nutritious diet and stimulating drugs, should be instituted at the outset, and operative interference should only be undertaken when the symptoms and physical signs give evidence of progression to the point of seriously lowering the general resistance by toxic absorption. The time to operate in this class of cases requires experience with the disease and judgment in regard to the patient's general condition. Some of these patients recover without operation, as noted by Brewer, Cobb and others, and in the seven cases mentioned in this report.

When an operation is undertaken in this class, nephrectomy is not the only procedure to be employed. Favorable results have been obtained by simple decapsulation,[1] by puncture of the infected areas with drainage[2] and by splitting the kidney, closing the kidney wound by suture and decapsulating the organ or decapsulation and drainage of the kidney pelvis as in cases of this class recorded in this report.

On the other hand, when the symptoms and signs are of a distressing nature and the affected kidney is found to be the seat of old as well as new inflammatory processes or when the acute process is extensive, as in some of the cases of this report, nephrectomy is the best procedure.

46 Gloucester Street.

1. Cotton: Ann. Surg., November, 1911.
2. Brewer: Tr. Am. Surg. Assn., 1908, xxvi.

ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. MACGOWAN AND CUNNINGHAM

DR. HUGH CABOT, Boston: The distinction between the hematogenous and the lymphatic types of infection is of importance, and I believe it cannot be made from symptoms. From the symptoms alone we are likely to regard as hematogenous cases which are, in fact, lymphatic. The distinction has been made clearer to me by Dr. Cunningham's paper, and it turns sharply on the condition of the urine. I believe that, in practically all the cases in which there is evidence of a previous infection in the urinary tract, the infection of the kidney is lymphatic in origin. Mallory's work has shown that many of these cases of acute kidney infection follow mild cases of chronic pyelitis which have been entirely overlooked. In going over my records of cases of acute kidney infections I have been surprised to find how many gave a history of pyelitis, even many years ago, and some of these acute kidney conditions have originated in a pyelitis of childhood and are lymphatic in origin. The symptoms in Dr. Cunningham's cases are entirely out of proportion to the condition of the urine, because the condition is practically a closed one. It has little or no access to the tubules, and the urine does not show the extent of the damage. On the other hand, in the lymphatic cases secondary to a process in the pelvis, the condition of the urine follows quite accurately the symptoms. The cases that show very little change in the urine with marked general symptoms are likely to prove hematogenous, while the cases that give few symptoms and marked changes in the urine are of the lymphatic type. I was pleased to hear Dr. Cunningham lay great stress, in the treatment of these cases, on the desirability of great caution in the practice of nephrectomy. Modern surgery has shown that amputation, whether of an extremity or of a kidney, is an admission of weakness. Many kidneys have been taken out for conditions which would have recovered with a damaged kidney, but one far better than none. That does not apply to tuberculosis, but I am dealing only with infections from other causes. We should retain these kidneys to the last moment, and resort to nephrectomy only when the patient will die without it. In a considerable number of cases I have operated with the belief that I shou'd be obliged to do a nephrectomy, and instead, have done some minor procedure, generally nephrotomy and occasionally decapsulation, with good results, though always with a damaged kidney. I do not believe that the majority of those cases are hematogenous. It has long been impossible to explain the lesions. They occur, as a rule, not in the glomeruli, but at the base of the pyramids in one group, and close to the pelvis in the other.

DR. B. C. CORBUS, Chicago: The work of Debré and Paraf, to which Dr. MacGowan made reference in his paper, consists in reversing the Wassermann reaction. We all know the difficulty of making a diagnosis in renal tuberculosis, both by looking for the bacilli in the urine and by guinea-pig inoculation. An animal is sensitized to the tubercle bacillus by injections of tuberculin, so that this animal contains specific antibodies for the tubercle bacillus. This "tubercle amboceptor" is used as an index, and the patient's urine contains the antigen. In the Wassermann an antigen looks for an unknown antibody. In the work of Debré and Paraf an antibody looks for an unknown antigen. The technic is simple. I have been working at it for a year, but failed until I could get a good antibody. One cannot get it from a tuberculous patient because his serum often contains both the antigen and antibody. If an animal is sensitized by injecting it with bovine tubercle bacilli you can get this specific antibody, and it is no trick at all to hook this back to the antigen in the urine. I have tried it in a few cases, but they are limited on account of the lack of material, but I hope later to have the pleasure of presenting this technic more fully.

DR. M. KROTOSZYNER, San Francisco: Regarding Dr. MacGowan's statement that the cystoscopic evidence in renal tuberculosis is invariably to be found at or around the ureteral opening of the affected side, I recall a case of a tuberculous kidney in a woman of 42, in whom the cystoscopic findings were entirely negative. On account of this and the persistent absence of tubercle bacilli in the urine sediment, the diagnosis of tuberculosis, which was strongly suspected, was abandoned and the kidney was exposed without the application of the guinea-pig test, which was, in all probability, the only clew to a correct preoperative diagnosis. Two foci of tuberculous caseation were afterward found in the removed kidney.

DR. J. H. CUNNINGHAM, JR., Boston: With regard to Dr. MacGowan's remarks on tuberculosis and the clear summarization of them by Dr. Cabot, there is much of interest. The fact that we have never as yet seen a healed tuberculous process in a kidney that can be proved to be such is of primary importance. The lymphatic infection of the kidney, spoken of by Dr. Cabot, is interesting and I believe our attitude with regard to the manner in which the tuberculous process is disseminated

in the kidney should be somewhat changed. What seems to be neglected, in considering infections within the kidney, is the fact that the kidney is an organ which may disseminate disease through itself by the channels already existing. We may have a single focus develop in a kidney as a hemic or ascending infection, and from that single focus other parts of the organ may be infected by the kidney channels. The cases which form the basis of my paper are examples of this sequence of events. I believe we have too often considered multiple lesions in a kidney to be simultaneous in this organ when, in reality, there was a primary renal focus from which other parts of the organ had become infected through the lymphatics, blood-vessels or the spaces in the connective tissue stroma.

DR. GRANVILLE MACGOWAN, Los Angeles: In this connection I will report a recent most interesting case. A man of 50, with pyuria, had had repeated attacks of left-side renal colic and had passed, at different times, a number of small stones after such attacks. Their frequency and severity had invalided him. A roentgenogram showed two large stones in the left lower pole. I catheterized both ureters, and obtained a macroscopically clear urine, which contained only a little albumin and a few red blood-cells. The phthalein test for functional capacity of the left kidney was better than that of its fellow; they were both normal. The patient had a large tumor in the left flank. I could satisfactorily explain this only by surmising the existence of two ureters on the left side leading to a double kidney, and that I had overlooked one. Following an atrocious attack I cut down on this kidney and found a perinephritis which was like a wasp's nest or honeycomb. The fatty capsule of the kidney was adherent to everything about it and so intimately to the muscles along the spine and the descending colon that they had to be dissected directly from it. The kidney itself was a sound organ lying in the midst of this undrainable surrounding tissue. There was no stone; the shadows had been cast by two cavities filled with granulation tissue, pus and débris which lay in the lower part of this mass and communicated with the ureter. The agent of infection was the *Staphylococcus aureus*. The kidney was removed inside its capsule, and the multiple abscess cavities were dissected off the healthy tissue *en masse*. The side had been injured two years previously by a blow from the crank of the patient's automobile. After the operation he was nauseated for days, and there was much pus in the urine for four days. On the ninth day, after a chill with a rise of temperature to 105 F., followed by anuria, on examining the right flank I found a tumor which proved to be a displaced kidney, probably dislocated by the retching following the first operation, causing a kink in the ureter. The kidney was exposed, delivered and decapsulated after pylorectomy to relieve pressure. Underneath the capsule of that kidney were hundreds of small miliary abscesses. The kidney presented by Dr. Cunningham reminds me of it. There was no abscess large enough to cut into and drain. The urine, which at the time of the preliminary examination had been normal, had during that nine days become infected. After decapsulation the kidney was suspended and drained for three days through the pelvis. At that time the patient's urine was perfectly clear, it contained no tube casts and no microscopic evidence of pus. I do not know, however, what the outcome will be.

Compiling Hospital Morbidity Statistics.—Bolduan has suggested a plan for compiling hospital morbidity statistics in this country. The method is especially applicable to the hospitals of a large city, but might be used for the hospitals of an entire state and is capable of being made nation wide in scope. The essential feature of the plan is the filling out of "discharge certificates," analogous to ordinary death certificates, on the discharge of each patient from a hospital. These discharge certificates are then sent to a central filing bureau, preferably the health department, and there classified and analyzed.—John W. Trask, Supplement No. 12. Public Health Reports, April 3, 1914.

AUTOGENOUS VACCINES IN TREATMENT OF SCIATICA

FRED. C. ZAPFFE, M.D.
CHICAGO

A man, aged 32, commercial traveler, consulted me because of an attack of sciatica (left-sided) which had continued practically unabated in the severity of the pain for eight months. During this time the patient had been under the continuous care of a number of physicians, but without more than slight temporary relief. He was kept from his work during all of this time, and, incidentally, lost not only time, but 60 pounds in weight. He was treated medicinally; the spinal nerve roots were injected with alcohol; he was given gonococcus vaccine; placed in a plaster-of-Paris cast; Buck's extension was applied to the leg; the Paquelin cautery was applied to the skin from spine to heel over the entire course of the sciatic nerve.

From these procedures he received only temporary relief. When I first saw him he was hardly able to walk because of the pain, nor could he lie down with comfort. He was in constant misery.

The history shows that he had an attack of gonorrhea six weeks before the sciatica began, and that about ten days after his doctor told him he was cured of his gonorrhea, he felt the first pain in the nerve. The clinical picture thereafter was characteristic of sciatica. There was no question about the correctness of the diagnosis. There was no evidence of a gonococcus metastasis elsewhere in the body.

Examination failed to find any pathologic condition except pain on pressure over the left sacral foramina. The spine could be put through the full range of motion, even violent motion, bending and rotating, without causing pain. Hip-joint disease was eliminated. Examination of the prostate gave negative findings. The teeth and gums were examined carefully and thoroughly by the patient's dentist. In short, there was no physical evidence of the cause of the sciatica, and yet when I took the temperature reading it was 99.6 F. at 8 p. m.

The examination was continued systematically. A Wassermann test was made, with negative results. The tuberculin test was also negative. The chemical examination was likewise negative. Roentgenograms were made of the spine from top to bottom, and of both hips and the pelvis. Very careful examination failed to disclose any evidence of anomaly or disease.

A clue as to the possible nature of the trouble was obtained from the temperature record. The curve was very erratic, the temperature ranging between 98 and 99.8 F., without any relationship to the time of day. The two-hour record was kept for a week and on not one day was the temperature normal throughout the day. The tuberculin test did not influence the curve in any way.

A bacteriologic examination of the urine was now made, and staphylococci and a diphtheroid bacillus were found. A culture of these organisms was taken and a vaccine was made. It was a mixed autogenous vaccine.

The first injection (hypodermically) of vaccine consisted of 100,000 bacteria. It produced a typical reaction. The patient felt slight chilly sensations; the temperature rose to 100.2 F., and the pain in the leg was somewhat increased in severity. The reaction subsided in twenty-four hours. Four days later the second injection was given. It consisted of 250,000 bacteria. Again only a slight reaction was obtained. The third injection of 500,000 bacteria, given four days after the second, produced a very slight reaction, but the fourth injection of 1,000,000 caused a decided reaction, far more marked than the first. Three more injections of 1,000,000 each were given, the reaction being slight after the first, and absent after the last two injections.

During the vaccine treatment the patient was encouraged to be outdoors, except for the first twenty-four hours after each injection; to eat well; to take some carefully prescribed exercise, and to observe personal hygiene thoroughly. He was given no medicine except magnesium citrate. The pain

in the leg rapidly eased up and after the fourth injection ceased entirely and has not returned since. Eight months have now elapsed since the treatment was stopped. The patient has regained his normal weight, feels well, and is able to do all his work in perfect comfort.

The vaccine treatment of sciatica has not received the attention it deserves. Little is said about it in text-books, and only gonococcus vaccine is mentioned. Greeley[1] cites one case treated successfully with a vaccine made from a throat coccus. He gave only three injections — 100 million, 200 million and 400 million, respectively, with a final precautionary dose of 800 million. This is the only citation of its kind which I have been able to find in the literature. If there are other reports, they have escaped me.

These cases open up a wide field for vaccine therapy, but in order to follow it out intelligently one must be versed in the whole subject of vaccine therapy. The cases must be selected carefully and the treatment must be given with good judgment.

All the phases of vaccine therapy have been discussed almost, one might say, *ad nauseum*, and yet the subject is but little understood; in fact, it is greatly misunderstood. That it has a definite place in therapy no one will deny, nor that it has its limitations, largely, however, growing out of lack of discrimination and error in judgment in the selection of suitable cases. The case, the dose, the reaction, the time of administration and the duration of the treatment must receive careful and *individual* attention. There is no rule of thumb. The mere fact that it is now generally recognized that there exist strains of bacteria and that these strains differ from one another emphasizes the necessity that only from an autogenous vaccine can one expect to receive any favorable results. Stock vaccines are a "hit or miss" proposition — more often "miss" than "hit."

The source of the infection, that is, the infection focus, must be determined, and usually can be found by patient, persistent search. It may be elusive, but it exists. And when found, a vaccine is easily obtained.

Cases not amenable to vaccine therapy will yield negative results; therefore, every other possible source of the sciatic pain should be investigated thoroughly before vaccine therapy is tried, and then the same principles which make for success in this form of treatment in general hold good here.

This case is reported solely to call attention to one source from which a sciatica may take its origin.

Clarifying Culture Mediums.—Filtering culture mediums containing agar-agar has always been more or less responsible for breaking the Second Commandment in all laboratories. The laboratory supplied with a heavy centrifuge equipped with an interchangeable head, fitted with large trunnion cups and carrying 250-c.c. or 500-c.c. tubes or bottles, will find in this machine the solution to the troublesome question of filtering agar. In our own practice we use 250-c.c. bottles. In the case of ordinary nutrient agar, we centrifuge the hot agar-agar solution before mixing with the beef juice to remove all suspended, insoluble foreign matter. After adding the beef juice and heating, the whole is again centrifuged for two or three minutes, which separates the coagulate completely, leaving a finished product that requires no further clarifying. Precipitates that form on subsequent sterilizations are quickly and completely removed in this way. Even with other mediums that readily pass through paper, considerable time is saved by the use of the centrifuge.—W. F. THOMSON, M.D., City Bacteriologist, Beaumont, Texas.

1. Greeley: H.: New York State Jour. Med., April, 1914.

New Instruments and Suggestions

A LATERAL PRESSURE SPLINT FOR FRACTURED NECK OF THE FEMUR

GEORGE CHANDLER, M.D., F.A.C.S., KINGSTON, N. Y.

The need of a simple method of applying an old principle in the treatment of fractured neck of the femur is the reason for presenting a splint which is particularly valuable for use in the outlying districts of small cities distant from big surgical centers.

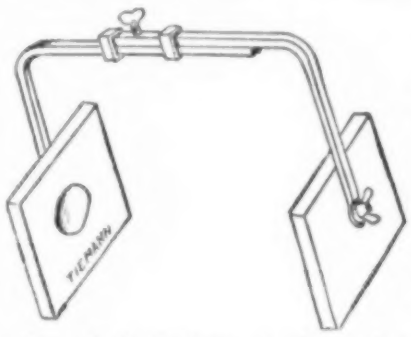
A surgeon practicing in a small town is frequently called into the country for a case of this kind and is confronted with the problem of giving his patient a satisfactory method of treatment without the appliances which a larger city affords.

In cities where assistants are at hand, large hospitals are convenient, and Roentgen-ray specialists can be secured, the abduction method maintained by a plaster-of-Paris splint, as advocated by Dr. Royal Whitman, is, of course, the ideal one.

A proper application of plaster of Paris, however, necessitates three or four assistants and an apparatus. This is obviously impossible in small communities.

Nor are the services of a trained nurse always available, on account of limited means, and it is conceded that, without proper watching, plaster of Paris is liable to produce pressure symptoms and other lesions in the aged, among whom this fracture more commonly occurs.

The method here described makes use of traction, abduction and lateral pressure, which are the principles of the plaster-of-Paris method, but embodied in a form that needs no skilled watching and can be applied by a surgeon unassisted. The method is as follows:



The author's lateral pressure splint for fractured neck of femur.

The patient is put to bed and a Buck's extension is applied as usual, the only difference being that the pulley at the foot of the bed is at the corner, and the patient's body is kept from the pulley side of the bed by sand-bags or bricks wrapped in flannel. By this means the leg is pulled obliquely away from the body, producing continuous abduction the same as in the Whitman method. After two or three days, when the muscles become sufficiently relaxed to overcome the shortening and to allow the fragments to be in apposition, the lateral pressure splint is applied.

The illustration shows it to be nothing more than a vise consisting of two boards connected by a sliding bar which is held in position by a thumb-screw. The boards are well padded and rest on either side of the hips grasping each trochanter, the adjustable bar being above and across the patient's pubes.

To adjust the splint, a hand is placed on either board and a gentle pressure exerted to press the boards against the trochanters. With the thumb screw loose, the sliding bars slip by each other and when the pressure is sufficient, a turning of the screw will maintain it and hold the splint solid.

The leg is at the same time held in a position which corrects the eversion of the foot, keeping it in its proper plane.

The cross-bar also serves to keep the bed-clothing from touching the patient and the splint gives him a sense of security. By reason of its firm grip, the use of the bed-pan is facilitated, as the patient can be rolled toward the uninjured hip without fear of displacement of the fragments.

Another advantage for the comfort of the patient is that the back can be easily bathed and rubbed, thus avoiding bedsores.

In impacted fracture the Buck's extension is not necessary, for obvious reasons, but the splint is of particular advantage in these cases, as it keeps the impaction from separating while healing is in progress.

During the past few years, I have used this splint successfully in fourteen cases, ages varying from 52 to 76 years, and have received reports from several other physicians who have had gratifying results from its use.

True, the diagnosis in these cases has been purely clinical and there have been no roentgenograms, but these cases had all the classical symptoms and were without doubt true fractures.

The patients, without exception, recovered and walked with remarkably little functional disturbance.

The simplicity, practicability and ease of adjustment of this splint make it an ideal method of treatment in communities where more elaborate appliances are not avilable.

AN APPARATUS TO ASSIST IN THE APPLICATION OF DRESSINGS ABOUT THE HIP*

H. W. Meyerding, M.D., Rochester, Minn.

In applying dressings, especially of plaster of Paris, in the region of the hip joint, a rest is needed which will add to the patient's comfort, allow sufficient working space, give a feeling of security during traction, permit easy removal and leave a well-fitting cast.

Patients not infrequently complain more of pain during and following the application of a cast than of the disease which required its application. Orthopedic surgeons find plaster a serviceable dressing because they have learned through experience to guard against the pitfalls attending its use. Sores due to pressure may be avoided by padding and smoothness of the areas of contact. The sacrum is one of the most common sites of such sores, mainly the result of flat, ill-fitting appliances which leave irregular irritating areas supporting the weight of the body.

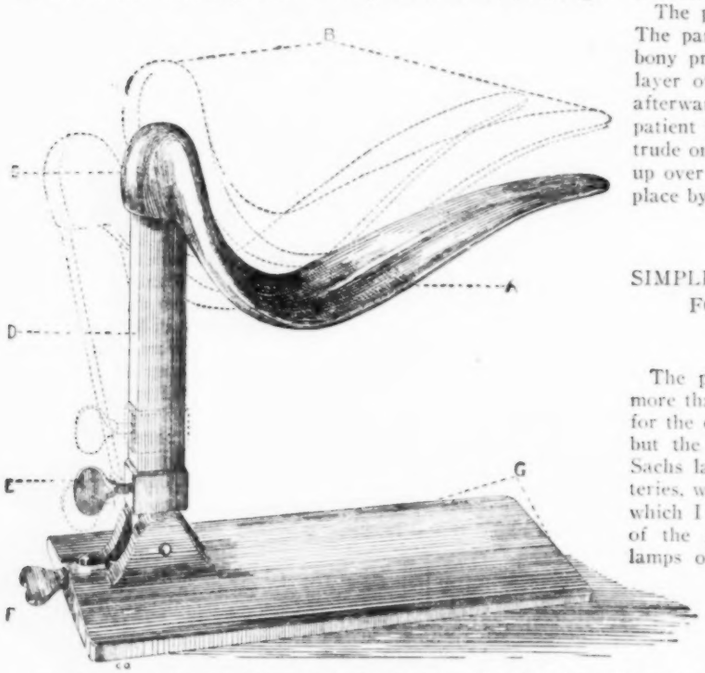


Fig. 1.—Removable rest (*A*) used to support cast while hardening. The various degrees of elevation of the tongue are shown; *B*, elevated position; *C*, a square joint which prevents rotation and allows traction against the perineum; *D*, a hollow rectangular bar to obtain elevation, fixed by a screw (*E*); *F*, screw fitted in heavy base (*G*), by means of which the bar (*D*) is tilted and the tongue lowered or elevated.

In order to insure perfect contact and avoid pressure-pain, the support should conform to the lumbosacral curve and allow as large a weight-bearing area as possible. Since a bone plate or graft may be loosened during the application of a cast, ease of application and removal are also important. An apparatus that will allow a certain amount of traction without slipping is also essential.

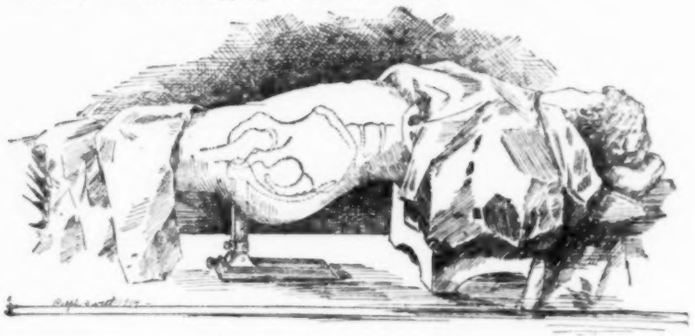


Fig. 2.—Sacral rest in position.

To meet these various requirements, casts of the lumbosacral region were taken of patients of varying ages in the prone position, and a support of average size was designed by me which has been used with satisfaction in the Mayo Clinic for the past three years. The apparatus is removable and can be left under the cast while hardening takes place. It may be lowered or elevated so as to meet varying degrees of tilting, as are found, for example, in ankylosis of the hip, and allows traction against the perineum (Fig. 1).

The patient is placed in position as shown in Figure 2. The parts to be covered are encased in stockinet, and the bony prominences are well padded with felt; then a single layer of flannel in the form of a bandage is applied, and afterward the plaster bandages. Trimming is done with the patient resting on the support, the flannel is allowed to protrude one-half inch beyond the plaster, the stockinet is drawn up over this and the rounded edges of the cast and held in place by a gluten bandage.

* From the Mayo Clinic.

SIMPLE ADAPTATION OF POCKET FLASH-LIGHT FOR EAR AND EYE EXAMINATIONS

Ralph A. Fenton, M.D., Portland, Ore.

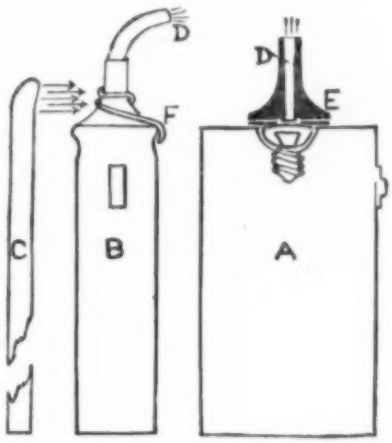
The principle of transillumination by a glass rod, used more than twenty years ago by Rochon-Duvigneaud of Paris for the eye, and later improved by Würdemann, is not new; but the instruments utilizing this principle (including the Sachs lamp) are all expensive and need special lamps, batteries, wiring, etc. No doubt others have hit on the expedient which I have used now for about four years: the addition of the glass rod to the smallest of the common flash-lamps obtainable.

I take a small hard rubber syringe pipe, cut it off and drill out to fit tight over a piece of $\frac{3}{16}$ inch glass stirring rod; cut the latter by nicking with a file to proper length, smooth the ends by melting in a gas or alcohol flame, and set firmly in place with collodion. The completed transilluminator is held in place over the end of the flash-lamp by a simple clip of spring nickeled wire, for example, a common paper-fastener straightened out.

For scleral or mastoid or frontal transillumination, or for throwing a small straight beam into the eye in looking for foreign bodies, testing pupillary reactions, etc., the simple straight tip is best. For use in the ear, the rod should be

lent on a radius of about ½ inch, so that it forms rather more than a right angle, say 120 degrees. The upper end of the rod should now be roughly filed into a little hemisphere; melting this smooth gives us a lens tip. Now mount in a syringe pipe as before, and it will be found that the rays travel around with the rod, so that a splendid view of the tympanic membrane may be readily obtained. The advantage of this for bedside work, and the freedom from the necessity of carrying head mirror and hunting up a portable lamp, have made it almost indispensable to me.

I also use a long rod acutely bent and then cut so as not to exceed its own diameter, and covered by thin rubber tubing, to carry a strong lateral beam into the nasopharynx. The view through the cocainized other nostril is then very clear. But this, and the fact that I have also adapted an old Marple electric ophthalmoscope to the same battery by using a glass rod of larger diameter to carry the light up to the point usually occupied by a miniature lamp of uncertain behavior, are not such generally applicable uses of this principle. I may say that on account of its portability and small size, as well as the ease of obtaining all the necessary repair parts, this home-made electric ophthalmoscope attracted much favorable comment in a number of clinics abroad and in the East last year.



Small hand battery, 2.7 volt flat top lamp; *A*, side view; *B*, end view; *C*, rod for nose and pharynx examination. *D*, glass rod. *E*, hard rubber syringe pipe. *F*, spring wire clip.

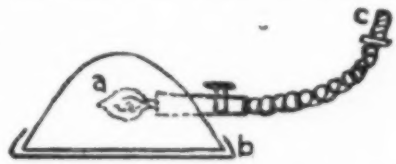
801 Stevens Building.

A CHEAP ELECTRIC HEATER

EDWARD VON ADELUNG, M.D., OAKLAND, CAL.

The following device has been used as a substitute for a hot-water bag for over two years, and has proved effective, convenient and cheap.

The outfit consists of a 2-candle-power carbon filament lamp in an ordinary metal scoop-like reflector, with sufficient cord and a plug to connect with a convenient fixture. The reflector is converted into a metal box by a sheet of tin which is cut the proper size to close the open side of the reflector, leaving small ears to be bent over to hold the tin on. To prevent the metal from coming in contact with the skin, the box is slipped into a flannel or cotton bag with a drawstring. The arrangement is made clear by the sketch.



Electric heater; *a*, 2-candle-power lamp; *b*, tin cover, *c*, plug.

A 16-candle-power lamp burning twenty-four hours in this box will not light even paper; therefore with a 2-candle-power lamp there is no danger of fire. Still, such a small lamp yields all the heat that one can stand.

The ease with which one can use it without getting out of bed renders it especially convenient, and gives it an advantage over the rubber bag. It cannot leak. It is not heavy. When placed over cloths rung out of hot water, and the whole covered with flannel, an application is obtained superior to the ordinary poultice, and not requiring renewal.

Any electric house can put the parts together at a cost of not over two dollars. The cost of maintenance is practically nothing.

A CLINICAL METHOD FOR THE QUANTITATIVE ESTIMATION OF SUGAR IN SMALL AMOUNTS OF BLOOD*

MAX KAHN, M.D., PH.D., NEW YORK

There are no *clinical* methods for the quantitative estimation of sugar in the blood. The chemical methods that are in vogue are also not specific for glucose. Certain of these methods determine the *reducing* substances in the blood. By the polariscopic method we obtain the total quantity of optically active substances in the circulation. Those methods in which the glucose in the blood is extracted by certain solvents have no clinical value, because the amount of blood necessary for each test is too great.

The test here recommended determines the quantity of "reducing" substance in the blood. It is based on Bang's process. Control tests were made with various known solutions of glucose and accurate quantitative results were obtained. The process is very simple and should require not more than from ten to fifteen minutes for the whole analysis. Two solutions are prepared:

1. Copper Solution: Five hundred gm. of potassium carbonate, 400 gm. of potassium sulphocyanate and 100 gm. of potassium bicarbonate are dissolved in 1,200 c.c. of water, warming if necessary to from 50 to 60 C. (122 to 140 F.), and then cooling to room temperature. One hundred and fifty c.c. of an aqueous solution of 25 gm. crystallized copper sulphate are added. The solution is then made up with water to 2,000 c.c. It keeps indefinitely.

2. Hydroxylamin Solution: Two hundred gm. of potassium sulphocyanate are dissolved in 1,500 c.c. of water and a solution of 6.55 gm. of hydroxylamin sulphate in water added. This is made up with water to 2,000 c.c. This solution also keeps well in a dark-colored bottle. Equal volumes of these two solutions should exactly correspond to each other. The presence of proteins does *not* interfere with this test.

Into a weighing flask from 15 to 25 c.c. of the copper solution from a graduated buret are put, and the flask weighed together with the liquid on a chemical balance. Fifteen drops of the patient's blood (taken from an arm vein or from an ear lobe) are allowed to fall directly into the copper solution in the weighing flask. In experimenting with rabbits it is quite easy to insert a needle of rather large caliber into an ear vein, and thus draw off from 15 to 20 drops of blood, the needle acting like a cannula. The flask is now weighed a second time, and the exact weight of the amount of blood taken for analysis is thus determined.

The blood and the copper solution in the flask are brought to a boil and filtered through a Gooch filter with suction. The coagulum is washed until the washings are perfectly colorless, from 10 to 15 c.c. of water being sufficient for such washing. The washings are united with the filtrate and titrated with the hydroxylamin solution, which is added slowly from a graduate buret until all trace of blue or green disappears from the filtrate. Since 1 c.c. of the hydroxylamin solution exactly decolorizes 1 c.c. of the copper solution, the amount of copper present in excess is thus determined, and the difference between the original amount of copper and the excess represents the copper reduced by the "sugar" in the blood.

With this method a number of determinations of sugar in the blood were carried out. In most instances the results obtained by the foregoing process were higher than the figures given by previous observers. This may be presumably due to less manipulation because of the simplicity of the method.

* From the Beth Israel Hospital Chemical Laboratory.

It was found that normal human blood contained from 0.14 to 0.19 per cent. of sugar. The blood of a diabetic patient who had a glycosuria of 2.7 per cent. contained 0.37 per cent. of sugar. Two nephritic patients had 0.21 per cent. (chronic interstitial nephritis) and 0.11 per cent. (acute parenchymatous nephritis) of sugar in the blood. In a very large number of analyses of the blood of rabbits, it was found that the normal sugar content varied between 0.11 and 0.18 per cent. (These experiments were carried out in the Government Laboratories at Washington, D. C.). Feeding sugar to rabbits raised the sugar content of the blood to 0.24 per cent. Subcutaneous administration of caffein (150 mg. per kilogram of body weight) induced marked hyperglycemia, the highest figure observed being 0.45 per cent. While zinc causes a marked glycosuria (by intravenous injection of the malate), it does not produce hyperglycemia; the sugar content in these cases seems to be normal or subnormal.

SUGGESTION OF CLOCK DIALS ON ANESTHESIA CHART

F. ST. CLAIR REILLY, M.D., HAVRE, MONT.

As an addition to any good chart I think this will settle the question always asked the man at the head of the table, "How long have I been working?" It may also point an accusing finger at many surgeons. I believe it is better for

Clock dials indicating unnecessarily prolonged anesthesia before beginning the operation.

the surgeon to wait five minutes than for the patient to breathe ether for forty-five before the first incision. These clock dials may be printed or put on the chart with a rubber stamp, and for the keeping of authentic records, only the stroke of a pencil is necessary.

A New Method for Hemostasis in Suprapubic Prostatectomy.—It requires no argument to prove that reliable and definite hemostasis is one of the principal requirements of the technic in suprapubic prostatectomy. Heretofore, procedures employed have been either by way of experiment, as the injection of serum, or temporary as digital compression, or an attempt at complete checking of the bleeding by tamponade of the prostatic site, which quite often led to renewed hemorrhage when the tampon was removed. The suturing of the prostatic cavity requires a considerable time and also may have as an accompaniment the retention of infectious secretions. It occurred to me to utilize the well-known hemostatic quality of fat for hemostasis in prostatectomy, using a free transplant of abdominal fat for a permanent tampon in the cavity resulting from the enucleation of the enlarged part of the prostate gland. The procedure is as follows: After completion of the enucleation the edges of the trigonal incision are seized with clamps and the cavity is temporarily packed with gauze, which may be advantageously dipped in serum. Now as much fat as its deemed necessary for the filling of the prostatic bed is dissected out of the abdominal wall, following either line of the skin incision, then the gauze packing is removed and the transplant is placed in the cavity resulting from the enucleation. The trigonal incision, now, with a few sutures inserted at the upper angle, is narrowed down to such a degree that any slipping out of the transplant is prevented. After this is done the bladder and abdominal wounds are attended to in the usual way. This procedure in nineteen cases so far was followed by such good results that I feel justified in recommending it to interested operators for further trial.—G. KOLISCHER, M.D., Chicago.

Special Article

PRACTICAL PHARMACOLOGY *

(*Continued from page 149*)

II

DRUGS WHICH ACT ON THE CENTRAL NERVOUS SYSTEM

We may consider the drugs of these groups with reference to the dominant action, whether it be stimulation or depression, and with reference to the part of the nervous system on which they exert the most pronounced effect. The action of a drug is never limited to one part of the nervous system; though in a given case it may be exerted mainly on the brain or medulla. Few drugs produce stimulation without some subsequent depression, or depression without at least fleeting stimulation.

Drugs which act mainly on the central nervous system will be classified as follows:

A. Stimulants: 1. Drugs acting mainly on the spinal cord, but having important actions on the medulla (strychnin group).

2. Drugs acting mainly on the medulla, but having important actions on the brain or cord (atropin group).

3. Drugs acting mainly on the brain, but with important actions on the medulla or cord (caffein and theobromin).

B. Depressants: 4. Drugs which act on the brain first, then on the medulla (morphin group).

5. Drugs which act mainly on the heat centers (antipyretics and analgesics).

6. Drugs which depress first the great brain, then the cord and the medulla last (hydrocarbon narcotics). (Order of involvement of first importance.)

This classification (like others used in these articles) is only approximate, and no attempt will be made to adhere to it rigidly.

A. STIMULANTS: 1. ACTING MAINLY ON THE CORD—STRYCHNIN GROUP

There are several drugs which have an action on the spinal cord similar to that of strychnin. While this is of some importance as a side action, strychnin and nux vomica are virtually the only drugs which are used for increasing the reflex activity of the cord.

Thebain (an alkaloid occurring in opium) has an almost pure strychnin-like action on the cord, and caffein, morphin and codein possess the action to some extent, though they rarely exhibit it in man. Caffein and codein are seldom given in doses large enough to cause any increased reflex excitability. In morphin poisoning in man death results from paralysis of the respiratory and other centers before the action on the cord has time to develop. In view of the subsidiary importance of reflex stimulation in the action of these drugs, the present article deals entirely with strychnin.

Strychnin acts on the spinal cord of vertebrates in such a way that the reflexes are increased, the effect increasing with the size of the dose, so that with the largest therapeutic doses in man there is distinct twitching of the voluntary muscles, and with larger doses any slight stimulus, such as touching, induces

* This is the second of a series of articles on useful drugs—on practical pharmacology for the general practitioner. As soon as completed, these articles, elaborated by additional subjects, will be published in book form.

a convulsive movement involving the closely related groups of muscles. If an excessive dose has been given, a stimulus which induces any reflex movement at all suffices to cause a convulsion involving all the voluntary muscles of the body. The intensity and duration of the convulsions increase with the size of the dose. The convulsion is followed by a period of depression varying from a few seconds to some minutes, and usually becoming longer with successive convulsions; but death may follow the first convulsion.

Strychnin convulsions are typical; there is at first a sudden contraction of the voluntary muscles, and if the dose has been very large this is immediately followed by tetanus with opisthotonos, the convulsion terminating with a few clonic jerks, followed by the pause during which the reflexes are actually depressed. If the first convulsion was brief, the depression may be followed almost immediately by a second convulsion if any stimulus is applied, or after an interval the length of which depends on various circumstances. The succeeding convulsions are almost exactly like the first in character, but they may be of shorter or longer duration.

ACTIONS OF STRYCHNIN ON THE MEDULLA

The actions of strychnin on the respiratory and vasomotor centers in the medulla probably differ only in degree from those on the cord, but it is difficult to determine the precise nature of this action on the medullary centers, and opinions differ as to the value of strychnin in conditions of circulatory depression.

When a normal animal is anesthetized and strychnin is injected into the circulation, no appreciable effect on the blood-pressure is produced until an amount is given equal to that which causes a distinct increase in the reflexes in a normal animal. Touching or pinching then causes a sudden rise of blood-pressure and a rapid return to normal. If a convulsive dose is injected, the rise in blood-pressure corresponds in duration to the convulsion. This rise of blood-pressure is wholly independent of any spasm of the voluntary muscles, for it occurs in exactly the same way in curarized (motionless) animals.

It is impossible to state whether or not therapeutic doses of strychnin affect the vasomotor centers so as to increase the blood-pressure when this is abnormally low, but it seems probable that in pathologic conditions with low blood-pressure, strychnin may render the vasomotor centers more susceptible to stimulation, and it is certain that it affects the circulation indirectly by increasing the tone of voluntary muscles through its action on the spinal cord in suitable cases.

The action of strychnin on the respiratory center is probably analogous to that on the cord, rendering it more responsive to stimuli, which normally play such an important rôle in the rate and depth of respiration, and under the influence of therapeutic doses of strychnin the carbon dioxid of the blood causes an increased respiratory movement, this being more pronounced when the respiratory center has been previously depressed by a narcotic.

With excessive (convulsive) doses of strychnin the respiratory center is first stimulated and later depressed. During the convulsions the respiration ceases, owing to the rigidity of the muscles of the chest; this causes an extraordinarily rapid increase in the carbon dioxid in the blood, which stimulates the respiratory center. Nevertheless, there is an interval, following the cessation of the convulsion and before the reinstatement of respiration, during which the center is evidently depressed, but this depression is much briefer than is the depression of the cord, as a rule, and the respiration begins shortly and is then deeper or more rapid than before the convulsion.

Following large doses the respiration fails to be reinstated after one of the convulsions, it may be the first, but usually after the second or third. Though opinions differ concerning the value of strychnin as a stimulant to the vasomotor centers, there is little doubt about its being an active stimulant for the respiratory center.

Strychnin stimulates the vagus center in the medulla, causing some slowing of the heart, but the rate of the heart depends on so many factors that this effect is not pronounced with therapeutic doses.

ACTIONS OF STRYCHNIN ON THE BRAIN

Strychnin increases the reflexes in the brain, especially those of the special senses, and vision, smell, hearing, touch and taste are rendered more acute. The effects on the eye and ear are utilized therapeutically. Strychnin sometimes exerts a marked psychic effect, causing a feeling of exaltation and relief from fatigue. This action is quite variable, and it is impossible to state when it may be expected.

ABSORPTION AND EXCRETION OF STRYCHNIN

Strychnin exerts a much greater action when administered intravenously than when administered in any other way, but it may be absorbed fairly rapidly from the gastro-intestinal tract and exert as great an effect after oral administration as after subcutaneous injection. The full effects of the oral dose are seen usually in about half an hour; the effects of poisonous intravenous doses are exhibited almost immediately. An extract of nux vomica, or a pill containing strychnin and some colloidal substance, is commonly employed when slow absorption is desired with prolonged action on the local nervous mechanism in the walls of the intestine.

Strychnin probably leaves the blood-stream very rapidly, and the larger part of a therapeutic dose is almost certainly eliminated from the body within a few hours, for fairly large doses may be administered several times daily for many days without causing toxic symptoms. Cushny states that elimination is not complete for a period varying from two to eight days. Strychnin appears in the urine soon after its absorption into the blood, and an amount equal to several times the normally fatal dose has been recovered from the urine of a dog in a period of five hours, during which large amounts of solution of sodium sulphate were injected intravenously in order to induce copious diuresis. (Unpublished experiments of R. A. Hatcher.)

TOXICOLOGY

Strychnin is among the most poisonous of the commonly used alkaloids, and as little as 0.03 gm. (½ grain) has proved fatal to a man. It is probable that the average fatal dose for a previously healthy adult is about 0.10 gm. (1½ grains). With appropriate treatment patients have survived much larger doses. One should never abandon hope of saving life until it is extinct, whatever the dose taken.

Death in strychnin poisoning usually results from respiratory paralysis, but a previously weakened heart may stop as the result of the sudden excessive rise in blood-pressure.

The method to be followed in the treatment of strychnin poisoning will depend on a number of factors, including the following: The total amount of the poison taken; the amount which remains unabsorbed (in case of its oral administration); the presence or absence of hyperexcitability or convulsions. Hence the following remarks are only intended by way of suggestion, and the treatment must always be adapted to the needs of the case in hand.

The physician will rarely be called on to treat strychnin poisoning after the administration of the drug in any way except by the mouth, because death usually follows so swiftly after the subcutaneous injection of a massive dose that no opportunity is afforded for effective interference.

So promptly does death usually follow the absorption of a fatal dose of strychnin into the circulation, that the mere fact that the patient is alive affords proof that at most but little more than the normally fatal dose has been absorbed, and when there is reason to suppose that any poison remains in the stomach, the chief efforts should be directed toward its removal or destruction.

If there is no increased reflex excitability, one should proceed to empty the stomach as quickly as possible. It may be washed with water to which strong tea[1] or half a pint or more of a 1 per cent. solution of potassium permanganate has been added, or with water alone if the tea or potassium permanganate is not readily available.

If the means for washing the stomach are lacking, an intramuscular injection of 6 mg. (1/10 grain) of apomorphin may be given at once, and strong tea or a pint of 0.5 per cent. solution of potassium permanganate may be swallowed by the patient. Should it become necessary to abolish vomiting, this may be done by inducing anesthesia with chloroform.

If hyperexcitability has been induced while there is reason to believe that the stomach still contains a notable amount of strychnin, the treatment is not so simple. It is imperative to remove or destroy any of the poison which remains in the stomach when it is practically certain that its absorption would prove fatal despite any treatment, but the washing of the stomach or emesis would be dangerous at a time when such measures are liable to cause convulsions. Emesis is then contra-indicated, and anesthesia must be induced before the stomach-tube is passed.

An especially difficult question arises when it is known that much more than the average fatal dose of strychnin has been swallowed, and when, owing to the length of time which has elapsed since it was taken, and the severity of the symptoms present, it seems probable that much of the poison has passed into the duodenum. In such a case the poison cannot be removed by gastric lavage, and it probably cannot be precipitated or destroyed by chemical agents, yet its complete absorption must almost inevitably prove fatal.

The procedure, however, in such cases must be much the same as in those in which some of the drug is supposed to remain in the stomach, and in addition, it is necessary to empty the bowel as quickly as possible, preferably by means of a copious saline cathartic.

The measures so far discussed are concerned with the prevention of the absorption of strychnin; apart from this are the questions of antagonizing its action after absorption and of hastening its elimination, both of which enter into consideration after absorption occurs, whatever the channel of administration.

Strychnin is eliminated by the kidneys, and whatever physiologic antidote is employed it should not interfere with diuresis, which should be promoted to the utmost. Hot tea or other hot liquids will induce diuresis, but the action is somewhat slow, and unnecessary loss of time should be avoided; hence a large amount of hot fluid should be introduced into the stomach, while as much should be introduced into the rectum and lower bowel as can be retained with comfort. In urgent cases it would seem to be justifiable to inject a quart or more of a sterile 2 per cent. solution of sodium sulphate into the veins, under suitable precautions, of course.

The value of ether in strychnin poisoning is shown by the fact that animals under its influence—they must be anesthetized completely—will survive more than twice the normally fatal dose of strychnin. Chloroform may be used to hasten the induction of anesthesia, but this should be continued with ether so long as may be necessary. Special stress is placed on the use of ether, for while hydrated chloral is commonly advised as an antidote to strychnin, pharmacologic experiments show that hypnotic doses of it are nearly, or quite, useless, and narcotic doses are dangerous in various ways. The dosage cannot be regulated so as to produce only the desired action; it is injurious to the heart; it lowers blood-pressure to the point that the respiratory center must suffer, while the elimination of the poison is seriously hindered.

Anesthesia may be maintained with ether without any of these disadvantages.

Artificial respiration should be employed when severe convulsions indicate that the respiratory center will suffer depression. One should not wait until actual respiratory failure occurs before instituting this measure. Unless the dose has been excessive, the convulsions can be controlled by this means. The inhalation of oxygen is an aid in hastening the destruction of strychnin. The treatment of strychnin poisoning may be summarized then as follows: removal of the drug from the stomach; precipitation by tannin; destruction by potassium permanganate; control of convulsions by ether; artificial respiration; elimination by copious diuresis, and avoidance of all stimuli, including touching the patient, noise and flashes of light. The chief reliance, if the patient is seen in time, must be placed in efforts to prevent the absorption of large amounts into the circulation.

THERAPEUTIC USES

Strychnin is probably not directly curative in any disease, but its capacity for increasing the activity of the reflex centers in the cord, medulla and brain suggest its employment in various conditions in which these centers are depressed, and its action on the vasomotor and respiratory centers indicates its use in various conditions attended with lowered blood-pressure and interference with respiration.

It is used in many forms of incomplete motor paralysis, but it should not be used when the paralysis results from a lesion in the cord, or in the presence

1. While the tannin of tea is useful as a precipitant of strychnin (Sollmann), it should be remembered that the beverage varies enormously in its tannin content. Some teas contain little tannin, and are practically useless for preparing an alkaloidal precipitant. While the physician is preparing to wash the stomach of the patient, he may have tea prepared as follows: Hot water is poured on the leaves and allowed to stand about one minute; this infusion is thrown away, because it contains caffein, which is synergistic with strychnin, but little of the tannin. Hot water is then poured on the leaves and allowed to stand about five minutes. This infusion contains most of the tannin and little caffein.

of inflammation of the nerve centers; it is especially contra-indicated in the inflammatory stage of infantile paralysis (anterior poliomyelitis). Opinions differ concerning its value after the paralysis has developed. In motor paralysis due to lesions in the brain, it is useful, in moderate doses, to maintain the tone of voluntary muscles through the increased reflexes.

Respiratory stimulants are useful when the center is depressed by narcotics, including alcohol, chloroform, ether, hydrated chloral and morphin, and in diseases of the respiratory passages and the lungs, including bronchitis and pneumonia, when there is a tendency toward respiratory depression. Strychnin can be used, but it must be remembered that large doses of strychnin depress the respiratory center, after first stimulating it. Such large doses are therefore contra-indicated, especially in narcotic poisoning, in which the stimulant action of the strychnin might be entirely masked by the narcotic, and yet the depression due to strychnin would be added to that of the narcotic. Caffein would seem to deserve the preference as a respiratory stimulant in narcotic poisoning at least.

Strychnin is often used for increasing the blood-pressure, despite the fact that no essential increase follows the administration of non-toxic doses to normal animals. It is quite possible that its effects in pathologic conditions attended with abnormally low blood-pressure may be beneficial, and, indeed, Osborne states that it is the sheet-anchor when all of the vital centers are depressed in pneumonia.

It is often used in shock, but opinions vary concerning its value in that condition. The mechanism of shock is so little understood that it is impossible to state positively what the effects of strychnin are likely to be. Crile believes that it has no value in that condition, but that, on the contrary, it is decidedly harmful, actually increasing the danger. In cases in which respiratory depression is the primary cause of shock, it seems probable that strychnin may be of value, but we have no satisfactory evidence that therapeutic doses are capable of increasing the blood-pressure directly to any notable degree in shock.

Strychnin is often used with occasional benefit in disturbances of vision (amblyopia, amaurosis) when there is no anatomic change or only incipient optic atrophy, and in impairment of hearing of central origin. It is often used to improve the tone of the weakened sphincters (in enuresis), but when there is spasm of the vesical sphincter it is contra-indicated; atropin should be used instead.

The use of strychnin as a simple bitter for improving the appetite and digestion and as an addition to cathartics will be discussed in connection with other drugs belonging to those groups.

It is often used more or less empirically in many different conditions, in some of which it is certainly useful, but in others probably useless.

It is often recommended as a "cardiac tonic," but we have no evidence of its direct action on the heart. It may slow the heart through vagus stimulation at times; it may improve the circulation through its actions on the vasomotor and respiratory centers—for one cannot wholly separate the influence of the respiration and circulation—and thus through the circulatory changes it may improve the nutrition of the heart, much as it causes improvement in the voluntary muscles and other tissues of the body, when it improves the circulation by increasing the muscular activity.

MATERIA MEDICA

Nux Vomica, U. S. P., the seed of *Strychnos Nux-vomica*, an oriental tree, at present comes chiefly from India and Ceylon. The fruit, a berry, is of the size and appearance of an orange, and contains usually from two to five of the flat circular seeds embedded in a mucilaginous pulp. The seeds are hard and extremely tough.

The drug is probably the most widely used (and abused) article in our materia medica, and with its alkaloid, strychnin, it is prescribed more frequently even than opium and its alkaloids and derivatives.

Extractum Nucis Vomicae, U. S. P., a powdered extract which contains 5 per cent. of strychnin, is usually employed in the form of a pill or capsule, frequently combined with iron and quinin, as a bitter tonic.

It may be prescribed somewhat as follows:

		gm.	
℞	Extracti nucis vomicae.....	0.4	gr. vi
	Ferri reducti.....	2.5	gr. xl

M. et fac pilulas xx.
One pill 3 or 4 times a day.

Or as follows:

		gm.	
℞	Extracti nucis vomicae.....	0.4	gr. vi
	Quininae sulphatis.....	2.0	gr. xxx
	Ferri reducti.....	2.0	gr. xxx

M. et fac capsulas xx.
One capsule to be given 3 times a day.

Tinctura Nucis Vomicae, U. S. P., is the more generally useful of the preparations of nux vomica, and is administered preferably diluted with water, or with water and syrup or fruit-juice at the time the dose is taken.

Strychnina, *Strychninae Nitras* and *Strychninae Sulphas*, U. S. P., are the three forms in which strychnin is official. They are colorless crystals or white powders, having an intensely bitter taste, which is perceptible in solutions containing 1 part of the alkaloid or its salt in 700,000 parts of water.

Strychnin and its salts may be administered in the form of pills, capsules or cachets, when the bitter taste is not desired. It is seldom administered by the rectum, but it is absorbed readily and may be given in the form of suppositories. It may be given hypodermically when for any reason the oral or rectal administration is contra-indicated, or when rapidity of action is essential; and in urgent cases it may be given intravenously in physiologic salt solution, of course, with the proper technic.

The salts are precipitated by the usual precipitants of alkaloidal salts, including alkalies, alkali carbonates, and by the bromids and iodids. Combinations of strychnin salts with precipitants in solution should be avoided, as the precipitate might escape detection and nearly the whole amount be taken in the last dose.

Dosage: The average single dose of strychnin, sulphate or nitrate, for oral administration is 0.001 gm. ($\frac{1}{60}$ grain), but the dose varies so widely that the statement of the average dose does not convey much information unless the purpose for which it is to be used is indicated. As little as 0.00005 gm. ($\frac{1}{1000}$ grain) is often used as a bitter tonic, and as much as 0.010 gm. ($\frac{1}{6}$ grain) may be given daily for short periods. Much larger doses have been used, but there is no satisfactory evidence that they are necessary, and their use is attended with danger. The dose, whatever it may be, should be reduced or dis-

continued for a few days when the appearance of muscular twitching indicates that the therapeutic limits are reached.

The treatment of partial paralysis calls for the administration of doses of 0.003 gm. (1/20 grain) three or four times a day for ten days, with an interval of a week before continuing it. Halsey states that at least that amount must be given to overcome depression of the central nervous system, especially in infectious diseases.

Poisoning by hydrated chloral, alcohol, chloroform and other narcotics may be treated with an initial intramuscular injection of 0.004 gm. (1/16 grain); if this causes an improvement in the respiration the dose may be repeated in about two hours if necessary, but if the strychnin adds to the depression, or if there is no improvement with that dose, caffein should be used, and, as stated previously, caffein probably should be used from the beginning. Morphin interferes with the movements of the stomach, and since strychnin is probably not absorbed readily from the human stomach, it should not be administered orally in the treatment of morphin poisoning, but intramuscularly, to secure quick action, and later by the rectum if desired.

Strychnin salts are absorbed readily from the gastro-intestinal tract under normal conditions, and from the subcutaneous tissues, the dose being approximately the same whether it be given by mouth, rectum or subcutaneously. In emergencies its action may be elicited almost instantaneously after intravenous injection, but the dose by this method of administration is only about half the oral dose.

Some authors state that large doses of strychnin may lead to toxic symptoms through cumulation, because of the slow elimination, but there is no danger of serious poisoning to be feared when the daily dosage is limited to 0.010 gm. (1/6 grain), and the administration stopped on the appearance of increased reflexes.

(*To be continued*)

Therapeutics

PREVENTION IS GREATER THAN CURE

(*Continued from page 151*)

XV

COUGHS

Before discussing the infections of grip and whooping-cough, it may not be out of place to refer to the varying kinds of cough. The trained nurse at the school, if not the teacher, should be able to note and describe the character of a child's cough to the medical inspector. Only by careful observation can the early stages of whooping-cough be suspected and discovered.

Coughing is an expiratory effort caused reflexly by some irritation. The muscles of the lower part of the chest are most engaged in the act of coughing; hence in severe, prolonged or frequent coughing muscle tire occurs in the lower part of the chest, both anteriorly and posteriorly. The abdominal muscles all take part in this expiratory effort, and the erector spinae muscles, the serratus, and the quadratus lumborum are all utilized in a strong expiratory cough. These muscle contractions compress in all directions the lower part of the chest, and the air in the bronchial tubes is forced upward, and if there is no obstruction is expelled through the glottis. If there is obstruction, or even partial obstruction, the upper portion of the lungs, especially the apices, become dilated, and temporarily, or in severe cases, permanently, emphysematous.

Cough can be caused by irritation of any of the mucous membranes of the air tract, by irritations of the nerves in the lung tissue, by irritations of the pharynx, by reflex irritation of the vomiting center, and by any irritation that can reach, through the pneumogastric nerve, the center in the medulla. From any of these reflex causes efferent impulses are transmitted, and the result is a cough. Irritation in the nose and ear may cause cough.

Pain and muscle tire from prolonged coughing, besides occurring in the lower part of the chest, occur in the sides, low down, perhaps in the region of the insertion of the diaphragm, and also in the back even down in the lumbar region. These strong contractions of the abdominal muscles during coughing also aid in temporarily diminishing the capacity of the thorax by pushing upward the abdominal organs. At the same time there is a considerable force exerted downward, which may tend to cause uterine displacements, hemorrhoids and even involuntary urination.

Before this forcible expiration or cough there is generally a deep, quick inspiration; then the glottis is partially closed and the air is propelled upward forcibly, causing friction which tends to expel anything on the walls of the mucous membrane of the bronchial tubes and trachea. Even in simple bronchitis, if there is much coughing, there will be found increased resonance in the apices of the lungs, as there is probably always a temporary emphysema.

Nasal irritations may produce cough as frequently as they cause asthma. Irritations of the nasopharynx and pharynx proper frequently cause coughing, which is very likely to be accompanied by retching and even vomiting. An elongated uvula may tickle the epiglottis and cause spasmodic, quick expiratory coughing. This cause, however, is rare compared with the frequency of cough caused by an enlarged lingual tonsil, whether the tonsil is hypertrophied, contains dilated blood-vessels, or is inflamed. Any disturbance of this gland or lymphoid tissue may cause a tickling in this region sufficient to produce a very irritating and disturbing dry cough, which comes on sometimes in paroxysms, until a certain amount of mucus is literally scraped off. The very intensity of the cough so irritates the part, like scratching a spot on the skin that itches, as to stop the tickling sensation for a time. Irritations of the larynx almost always cause cough. Hence no examination of a patient who coughs is complete without a throat and larynx observation.

The dry bark of spasmodic croup is very characteristic. The noise is low pitched, and is a bark. If it is husky there is mucus or membrane present.

The cough of bronchitis can be of all descriptions; it may be dry, may be non-productive, and may be moist and productive. Pain in such cough (the same is true of grip) is referred under the sternum, and is due largely to the vibrations of the air causing pain to the inflamed mucous membrane of the trachea and perhaps larger bronchi.

The cough of pneumonia is at first somewhat painful, and the pain is referred to the side, near the nipple. This cough may be at first dry, but is soon productive and generally should be encouraged.

The cough of pleurisy is non-productive and undesired, and is never loud. It causes pain referred to the side, and is repressed by the patient. There is nothing to expectorate, and it should be discouraged and stopped.

The cough in the first stage of tuberculosis is often dry and catchy; it is a hack. There is no great intensity to this cough, and no necessity for it, and it should be discouraged. As soon as there is much local bronchial catarrh the cough should, as it is then productive, not be discouraged, except at meals, and in the presence of others; that is, such patients should be taught when to cough.

The cough of asthma is a wheezing affair and accompanied by all sorts of rattlings; the same type occurs in a stuffy, asthmatic bronchitis. This cough is generally not harsh.

The coughs of different individuals vary. Some always cough with great intensity, and others easily and lightly. Older persons seem to raise mucus and pus from the bronchial tubes with difficulty. It takes a great many coughs to raise the sputum for expectoration. Young children generally cough easily, but generally swallow their sputum. Very weak patients will hardly expectorate at all. In such cases the foot of the bed may be raised at night; also when they cough, while in bed, they should turn onto the side or stomach in order to raise the sputum, or they should lean over in order to have gravity aid as much as possible the expulsion of the mucus, etc. The cough of pertussis occurs in showers or paroxysms, and at the height of the disease the glottis closes during inspiration and the air is sucked in through a more or less narrow slit, giving the characteristic "whoop."

Persons coughing very hard, as typically in whooping-cough, but also in emphysema and in the severe bronchitis of strong, sturdy men, will cause a great deal of cardiac disturbance by retarding the flow in the large vessels of the thorax, thus increasing the work of the heart, especially of the right side. Such coughing can force backward the blood in the large veins, thus congesting all the organs, notably the eyes, face and head, and whooping-cough can cause a cerebral hemorrhage or a hemorrhage into the eyes. These patients may not infrequently have nosebleed, and even vomit blood.

ACUTE BRONCHITIS

A child with an acute bronchitis, with expectoration, whether with or without fever, should generally be sent home; or if he is not acutely sick and continues to attend school, he certainly should be watched. There is no question that, whether bronchitis occurs in an adult or in a child, the patient will recover more quickly if he remains in bed for one or more days.

The prophylactic treatment is the same as for an acute coryza, and these treatments will more or less relieve the congestion in the bronchial tubes and promote expectoration, if the disease is not aborted. The cough is at first non-productive, but as soon as mucus begins to be plentifully expectorated the cough is productive, the tightness in the chest is relieved, and the patient feels better. One of the best promoters of a free mucus secretion is ipecac, and a few drops of the syrup of ipecac, given every hour, unless nausea is caused; or from 0.03 to 0.05 gm. (about ½ to 1 grain) of the powdered ipecac may be given every two hours. The ipecac should never be pushed to the point of causing uncomfortable nausea. The dose should, therefore, as suggested, be very small.

In the second stage of bronchitis there is no expectorant that seems to work so well as ammonium chlorid, and the dose should be about 0.25 gm. (4 grains) every two hours. The bad taste of this drug may be well covered up by giving it in a sour mixture, as the syrup of citric acid and water. If the cough is excessive and more than the secretion calls for, there is possibly no better method for its control than to give small doses of codein sulphate. This may be combined with the ammonium chlorid in a sour mixture, as:

		Gm. or c.c.	
℞	Codeinae sulphatis.....	0.20	gr. iv
	Ammonii chloridi.....	5	ʒ iss
	Syrupi acidi citrici.....	25	fl.ʒ i
	Aquae.....q. s. ad	100	fl.ʒ iv

M. et Sig.: A teaspoonful, in water, every two or three hours.

This prescription is for an adult, but may be readily modified according to the age of the child. If the codein is not desired, it may be omitted. If it is desired to give the ammonium chlorid less frequently, the dose may be made larger. If a sweeter mixture is preferred, the syrup of tolu may be substituted for the syrup of citric acid; or both the syrup of citric acid and the water may be omitted and the syrup of wild cherry substituted.

If the larynx is inflamed, the inhalation of simple steam, or various other inhalants, may be of value, but a patient with laryngitis of any type should be under very careful observation by a physician.

If the expectoration becomes more profuse and seems not to stop readily, terpin hydrate seems to be of value. The dose is 0.30 gm. (5 grains) about four times a day. This may be given in tablet or in powder; solutions are unsatisfactory as it is very insoluble. If deemed advisable it may be combined with codein or heroin in small doses. There is, however, no real advantage in heroin over codein.

If the coughing persists longer than a week, the sputum should be examined to determine what germs are present. If it proves to be a simple bronchitis, but prolonged, sodium iodid in small doses may be of value, especially if the patient is at all asthmatic, or if it is in an older person. Fresh air, good food and iron are always of value in curing all kinds of bronchitis. If the patient is a child and the nutrition is poor, cod-liver oil is good treatment. A bronchitis that will not stop must be treated as a pre-tuberculous stage of tuberculosis, and the patient should receive climatic, or open air rest cure treatment.

It should be emphasized that a patient with bronchitis is not properly supervised unless the temperature is taken, and this more or less frequently. A patient with a fever should remain at home, if he wishes to avoid complications that readily occur from an acute bronchitis or grip. The district nurse or the medical inspector should always take the temperature of a coughing child. If a child has any fever, it should be sent home and the family physician summoned.

ASTHMA

As previously mentioned, a child in school that is found to be asthmatic should be carefully examined by the medical inspector and referred to the family physician, and if necessary, to a nose and throat specialist, to determine whether or not there is a reflex cause, and to have this cause removed if possible. The asthmatic habit once well acquired is difficult to cure.

(To be continued)

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COLUMBUS AND VESALIUS—THE AGE OF DISCOVERERS

Since the beginning of the new year, a series of celebrations of the four hundredth anniversary of the birth of Vesalius has taken place at various of the more important medical centers of the United States. There was to have been a magnificent memorial festival in Brussels, the birthplace of Vesalius, and an auxiliary celebration at Louvain, at whose university Vesalius obtained his preliminary and medical education. Owing to war conditions these celebrations were impossible, and it is interesting to realize that the great Flemish genius, to whom the world owes modern anatomy as it has developed for four centuries, had to look for the celebration of his quadricentenary to a country in the distant West discovered only about twenty-five years before his birth.

To Americans, perhaps the most interesting phase of Vesalius' life and career as a great founder in the most important of medical sciences is the fact that it should have occurred in such close relation to the discovery of America. His work represents a portion of the background of the intellectual life of Europe at the time of the discovery of this continent which must be known if the genuine significance of Columbus' great discovery is to be appreciated. Ordinarily, owing to rather limited knowledge of Columbus' environment and the difficulties which he encountered in securing assistance for his voyage, and the general skepticism with which his views as to the possibility of reaching land by sailing westward were met, it would seem as though there must have been little intelligence, slight diffusion of information, and an almost entire lack of incentive as regards human progress and development at that period.

Any such assumption, however, is quite contrary to the real state of affairs as regards culture and intellectual life during what may be called without too great demands on the historical imagination the century of Columbus, that is, the hundred years more or less from the birth of Columbus to the death of Vesalius. As a matter of fact, the number of men who did marvelously good work in painting, architecture, sculpture, and the arts and crafts at this time is wonderful. Columbus had in Italy three such supremely great contemporaries as Raphael, Leonardo da Vinci and Michelangelo. These are the greatest painters and sculptors since the time of the Greeks. They are much more, however. Raphael, besides being the greatest of painters, was one of the greatest of archeologic scholars of his time. Leonardo da Vinci once beat Michelangelo in sculpture, but thought of himself as a constructive engineer, and invented the wheelbarrow and the removable derrick, besides machines for sawing marble, lifting monoliths, filing saws and a number of others, and made basic discoveries in acoustics, botany and geology, as well as in anatomy and mechanics. Michelangelo was painter, sculptor, architect—nothing greater than St. Peter's has ever been built—and wrote sonnets that have only been equaled, probably not surpassed, by those of Dante and Shakespeare. All three of these men were alive in Vesalius' lifetime.

There were probably a score of artists in Italy in this period who would have been surpassing leaders in art at any other time. Such names as Titian, Botticelli, Fra Angelico, the Bellinis, the Vivarinis, Tintoretto, Veronese, Andrea del Sarto occur among the contemporaries of Columbus and Vesalius. Then, too, this was the great Renaissance period of scholarship, as well as the time when the most beautiful books ever printed were issued; it was the period of the learned women of the Renaissance, those scholarly "blue stockings" whom so many persons seem to forget when they talk of our period as the first in which women have ever been afforded the opportunity for the higher education. Besides, this period saw in every country in Europe a great development in music and the musical inventions, as well as in literature. Villon, for instance, and Charles of Orleans and the Pleiades and Rabelais did their writing at this time, and Montaigne was being educated for his life work.

It has been well said that whenever a period does any one thing well it always does well everything to which it seriously turns its attention. Following this rule, it is not surprising that there should have been a series of great scientists doing their work in what has been called the Columbus century. Copernicus revolutionized astronomy much more than even Vesalius did anatomy. Ambroise Paré, who has been called the Father of French surgery, wonderfully developed that department of medical sciences and practice. A series of botanists, practically all of them physicians, laid the foundation of botany broadly and deeply. The most important therapeutic discovery ever made, that of the use of mercury for the treatment of syphilitic conditions, received at this time its amplest development, with its indications and limitations. This is probably the most important period in the history of mathematics. Mechanics received a marvelous impetus from the great construction work

undertaken by the architects of the time, and that magnificent series of contributions to the medical sciences in anatomy, physiology and clinical medicine was initiated. Such names as those of Eustachius, Fallopius, Columbus (Realdus), Verolius, Sylvius, Guinter of Andernach, Servetus, Fracastorius and many others occur at this time. Their books have now become precious treasures in medical bibliography. They were issued as a rule in magnificent printed editions not unworthy of Vesalius' own great textbook of anatomy, which has been declared probably the most beautiful medical book ever printed.

It is this background of the life of Vesalius and its relation to the discovery of America that should remain as a precious memory to the American medical profession, on whom the war has caused to devolve the duty of celebrating the four hundredth anniversary of the great Father of Modern Anatomy.

THE DELICACY OF ORGANIC REGULATION IN THE BODY

In the protest against the current tendency to seek the explanation of all physiologic processes in purely mechanical factors and to attempt the solution of the problems of living organisms on a physicochemical basis solely, the distinguished Oxford physiologist J. S. Haldane has cited some striking illustrations of the delicacy of organic regulation in the body.[1] We do not refer to these for the purpose of joining the author in his revolt against the hypothesis that life, as a whole, is a mechanical process, or to emphasize the difficulties into which the mechanistic conception falls when it deals with an organism such as that of man. The human body is a vast assemblage of the most intricate and delicately adjusted cell mechanisms, each being so constituted as to keep itself, as Haldane remarks, in working order year after year, and in exact coordination with the working of the millions of other cell mechanisms which make up the whole organism. The present comment is intended, rather, to point out some of the delicate and persistent responses that are encountered in the body — reactions that are all too often overlooked by the physician who centers his attention on some single organ or some localized function, and forgets the surprising interrelations between distant parts of the organism.

One of the most striking instances of this cooperative functioning is exemplified in the astounding fitness with which the kidneys, respiratory center, and other parts regulate the composition of the blood. Haldane reviews this topic as follows: The respiratory center is so extremely sensitive to any increase or diminution of the partial pressure of carbon dioxid in the blood that a diminution 0.2 per cent. of an atmosphere, or 1.5 mm. of mercury, will cause apnea, while a corresponding increase will double the breathing. The recent researches of Hasselbalch have afforded experimental evidence of what had already seemed very probable — that the stimulus to which the center responds is the difference in hydrogen ion concentration, or acidity, brought about by the very slight deficiency or excess of carbon dioxid. He has also investigated quantitatively the effects on the hydrogen ion concentration of the blood of varying the partial pressure of carbon dioxid. The hydrogen ion concentration of the blood during rest is extraordinarily constant, and remains so day by day and year by year. As the amount of acid and alkali passing into the blood from the food and other sources is constantly varying, it follows that the regulation of hydrogen ion concentration is mainly brought about by the kidneys. It has been known for long that the urine varies in acidity or alkalinity according to the diet; but Hasselbalch has measured the actual variations in hydrogen ion concentration. It appears that during ordinary resting conditions the variations in hydrogen ion concentration of the urine are about a hundred thousand times as great as those of the arterial blood. Thus the kidney epithelial cells react so delicately to variations in hydrogen ion concentration of the blood, that the very smallest variation in the direction of acidity or alkalinity excites them to excrete a liquid which is, relatively speaking, intensely acid or alkaline, the net result being that the normal hydrogen ion concentration of the blood remains practically constant.

The beauty of organic regulation is not confined to this field alone. We are reminded that we meet the same delicacy of adjustment in the regulation of such things as body temperature, blood volume, or heat production. So accurately does the body adjust its consumption of oxygen and of food material to its energy requirements that it can actually be used, as Rubner found, as a calorimeter; for it substitutes consumption of proteins, carbohydrates, and fats for one another in exact proportion to their energy values as determined with a calorimeter. In Liebig's time this delicate regulation was altogether unknown.

It may matter little whether such illustrations compel us to abandon attempts at a "simple" explanation in terms of chemistry and physics, and lead us to conclude with Haldane that such a conception of biologic processes breaks before the phenomena of life. We may prefer, with the mechanists, to await the further revelations of science before accepting any vitalistic or spiritualistic interpretations. Nevertheless, we can still agree with Haldane that "it is hard to realize that something which looks under the microscope like nothing more than a somewhat indefinite collection of gelatinous material can react, true as the finest mechanism of highly tempered steel, to the minutest change in its environment."

1. Haldane, J. S.: Mechanism, Life and Personality, New York, E. P. Dutton & Co., 1914.

A NEW DEPARTURE IN MEDICAL LICENSURE

The unsatisfactory results of the conventional methods for drafting laws for the regulation of the practice of medicine have been generally admitted. In many states, the introduction of bills providing for separate boards and different standards for each new and fantastic sect or cult has become an expected feature of every session of the legislature. Yet the growth of knowledge regarding preventable diseases, and the increasing appreciation on the part of the public of the importance of state efforts for the conservation of life, are developing an appreciation of the importance of regulating equitably and permanently the licensing by the state of those who desire to treat the sick for compensation.

As an executive and as a member of both houses of the state legislature for many years, Hon. George H. Hodges, Governor of Kansas for the last two years, has had an extensive opportunity for consideration of this question. Realizing the unsatisfactory condition of the practice laws in most of the states, the governor appointed a commission to consider the entire question and to draw up and recommend for passage a bill providing a single standard for all persons desiring to treat the sick, regardless of the school of practice to which they might belong. On this commission were appointed Dr. J. A. Milligan of Garnett, formerly a member of the state senate; Dr. J. E. Sawtell of Kansas City; Prof. W. L. Burdick of Lawrence, dean of the law school of the state university; Hon. Fred D. Smith of Hutchinson, formerly speaker of the House of Representatives, and Mr. F. T. Ranson of Wichita, president of the Stock-Yards National Bank. This commission has drafted a bill providing for a preliminary examination of all persons desiring to practice medicine, surgery or any other form of healing art. The bill provides for a board of preliminary examination, made up of the chancellor of the state university, the president of the state agricultural college and the president of the state normal school, *ex officio*, who shall examine all persons desiring to treat the sick in any way. Any persons seeking a license from the state medical board, the board of osteopathy, the board of chiropractic or any other board must first satisfy the board of preliminary examination that he has had a four years' course in some reputable or established high school or its equivalent, and has spent at least four years of at least eight months each at some reputable professional school which includes in its course anatomy, physiology, pathology, surgery, obstetrics, chemistry, bacteriology, symptomatology, diagnosis, urinalysis, hygiene and sanitation. Suitable sections for the administration and enforcement of the act are included, together with sections amending the medical practice, osteopathic and chiropractic laws so as to make them uniform with the proposed bill.

Medical practice acts are primarily and solely for the good of the public. The report of this commission marks an epoch in medical legislation. It is the first distinct recognition of two important principles which must sooner or later dominate such legislation in all of our states. The first is the necessity and equity of a single standard for all persons, regardless of "schools," and by inference, the inequity of different standards for different schools. The second and equally important principle is that the examination and licensing of persons desiring to treat the sick for compensation is not a medical but an educational problem. The recognition of this fact in the designation of the three leading educational authorities of the state as the board of premliminary examination is a most important step in the development of better conditions in state regulation of the practice of medicine.

DYSPNEA IN CARDIORENAL DISEASE

Certain types of both cardiac and renal disease are attended with disturbances in respiration which occasion unpleasant manifestations. Sometimes the conditions of the heart and kidneys are believed to contribute jointly to the difficulty that may arise. The occurrence of Cheyne-Stokes breathing in uremia has been attributed to cardiac failure which is undoubtedly one of the common causes of such dyspnea; but the labored breathing at times attending renal disease may be independent of the heart in its origin. There is urgent need to-day of a clearer understanding of the immediate physiologic and pathologic conditions which underlie dyspnea, instead of the vague charges against the different organs which are more indirectly involved in the transaction.

The questions to be solved concern the nature or size of the stimulus to rapid respiration. The well-established view that the exciting stimulus to the respiratory center is the carbon dioxid content of the blood has been broadened to refer to the hydrogen ion concentration of the circulating fluid. The variations in the carbon dioxid content of the blood, and consequently of the alveolar air, are but the result of the attempt on the part of the organism to keep the hydrogen ion concentration of the blood at a constant value. The carbon dioxid in the blood rises as the amount of non-volatile acid falls, and the carbon dioxid falls as the production of other acids rises. Any tendency to the production of an acidosis in the body is immediately compensated for by an increase in respiration and a washing out of carbon dioxid. It seems probable that the kidney is the fundamental regulator of the reaction of the blood, but the lungs, acting more quickly in response to sudden calls, serve, as has lately been remarked, as "the more delicate balance-wheel of the regulatory mechanism."

Hasselbalch[1] has emphasized the fact that in addition to the acid stimulus, the excitability of the respiratory center must be taken into account in any consideration of the factors that govern the chemical regulation of respiration. Even with an unchanged composition of the blood in respect to non-volatile acids and carbon dioxid, the threshold of excitation of the center may be altered and change the respiratory function. According to Lindhard,[2] the excitability of the respiratory center varies inversely with the oxygen tension.

Blood, which directly bathes the respiratory center, urine, which represents the outcome of the renal device for controlling the neutrality of the blood, and the alveolar air, by which the pulmonary regulatory device is judged, all need to be studied in any fundamental investigation of the dyspnea encountered in cardiac and renal disease. A good beginning in this direction has been made at the Peter Bent Brigham Hospital in Boston by Dr. Francis W. Peabody.[3] As he has pointed out, it is quite possible that different causes for the dyspnea in various types of uncomplicated heart disease may be ascertained, and the study of large numbers of cases may lead to the recognition of definite groups of functional derangement.

In uncomplicated cases of chronic nephritis the mild acidosis which is a frequent accompaniment is taken care of by the kidneys as a rule. According to Peabody, it is only in uremia and usually only in very advanced uremia that non-volatile acids accumulate in the blood in an amount sufficient to cause depression of the tension of carbon dioxid in the alveolar air. In the terminal stage of uremia there may be a high grade of acidosis. The development of acidosis is not the direct or sole cause of dyspnea associated with cardiorenal disease. A high grade of acidosis may exist without causing a change in respiration which is evident on the ordinary clinical examination. In some cases of cardiac disease accompanied by dyspnea there is evidence of a slight accumulation of non-volatile acids in the blood. In other cases there is no evidence of such an accumulation. The hydrogen ion concentration of the blood remains normal.

Peabody has shown groups of cases in which the degree of acidosis is not sufficient to account for the dyspnea on the basis of an increase in the stimulus to respiration alone. He concludes that an important factor in the causation of dyspnea in cardiac disease is an increase in the excitability of the respiratory center. Such a change in excitability may well be caused by a lowering of the oxygen tension, and be dependent on an inadequate blood-flow. There may, of course, be developed some as yet unknown substance which affects the stimulus. Until the excitability of the respiratory center under pathologic conditions has been experimentally studied, we may accept the hypothesis tentatively advanced involving the consequences of a poor circulation and possibly a partial oxygen want at the respiratory center. In combined cardiorenal disease, the dyspnea would thus be a circulatory feature, the renal condition playing only an accessory part.

1. Hasselbalch, K. A.: Neutralitätsregulation und Reizbarkeit des Atemzentrums in ihren Wirkungen auf die Kohlensaurespannung des Blutes, Biochem. Ztschr., 1912, xlvi, 403.
2. Lindhard: Jour. Physiol., 1911, xlii, 337.
3. Peabody, F. W.: Studies on Acidosis and Dyspnea in Renal and Cardiac Disease, Arch. Int. Med., August, 1914, p. 236.

THE HIGH-CALORY DIET IN TYPHOID FEVER

The fear has at times been expressed that the administration of large amounts of food during the febrile stage of typhoid fever may cause too great an increase in heat production and in turn a rise in temperature. From a purely clinical point of view von Hoesslin[1] long ago doubted this possibility. The modern conception of the specific dynamic action of the foodstuffs in metabolism has, however, again given some justification for the reconsideration of the question. It is now admitted that the total metabolism of normal individuals is raised after the taking of food when the latter is furnished in quantities larger than the "basal" requirement. If, for example, the energy metabolism of a subject at rest and without food is determined, the administration of a diet just equivalent to the requirement thus ascertained will not suffice to maintain the usual energy balance. The metabolism of the ingested foods results in raising heat production; and this is the phenomenon of the specific dynamic action of the foods, so called by Rubner.

Whether or not the increase in heat production becomes evident depends on the environment. So long as the chemical regulation of body temperature is called into play, the extra heat liberated may compensate for heat which might otherwise be liberated from other sources in the body; but in the absence of chemical regulation, that is, at temperatures (above 30 C. or 86 F.) at which physical regulation alone suffices for this function, the excess of heat production associated with liberal intake of food comes plainly into evidence. The proteins in the diet are by far the most potent factors in leading, under appropriate circumstances, to a liberation of energy considerably larger than that evoked by the non-protein foods.

The possibility of the exhibition of a specific dynamic action of food in typhoid fever as a consequence of the high-calorie diets which have of late again found favor in this country has to be reckoned with. The undue production of heat incident to the taking of exceptionally large amounts of food during the febrile stage would be far from desirable. In a

1. Von Hoesslin: Experimentelle Beiträge zur Frage der Ernährung fiebernder Kranken, Virchows Arch. f. path. Anat., 1882, lxxxix, 95, 303; Ueber den Einfluss der Nahrungszufuhr auf Stoff- und Kraftwechsel, ibid., p. 333.

careful series of measurements made in the Bellevue Hospital of New York, Coleman and DuBois[2] have found that in typhoid fever the liberal diets proposed by Coleman and his collaborators[3] occasion only a slight, if not negligible increase in heat production. It was quite unexpected to find that the large amount of food administered exhibits little or no specific dynamic action. In explanation of this result it is suggested that the stimulation of metabolism by the toxic agent is so intense that further stimulation by food is insignificant. The chief theoretic objection to the use of the liberal diet in typhoid fever is thus set aside.

Current Comment

A NEW JOURNAL ON SOCIAL HYGIENE

The American Social Hygiene Association, recently organized through the amalgamation of several independent organizations, has taken a position that indicates that it is soon to become recognized as the dominant organization working for social and sex hygiene. As one of its activities, the association has established *Social Hygiene*, a quarterly, the first number of which has just appeared. In it President Eliot sets forth the motives and purposes of the association, stating that the first work to be undertaken is that of ascertaining present conditions as regards sexual vice in American cities and towns; next, to study the various sorts of police action against vice and the statutes intended to control it; third, to devise and advocate effective control and legislation; and fourth, to cooperate with other organizations working along similar lines. President Eliot regards as one of the most difficult but indispensable tasks of the association the bringing about of a serious change in the ethics of the medical profession, particularly the attitude of the physician regarding knowledge on venereal infections gained from patients as a matter of professional confidence. While he admits that "in times past the faithful keeping by the physician of the confidences of his patient has been a fine element in the ethics of the profession," he also feels that "the recent discoveries in regard to the contagion, duration and far transmission of venereal diseases have made it necessary to put limitations on a physician's pledge of secrecy, lest he become a silent participant in one of the worst of crimes." Other articles discuss the red light abatement law, the legal protection of matrimony from disease, the regulation of prostitution in the United States, the relation between education and the social hygiene movement, the interest of life insurance companies in social hygiene, etc. Law notes, book reviews, abstracts and news items complete an interesting publication. If the present high purposes and plans of the American Social Hygiene Association can be realized, the organization will prove of enormous benefit to social and public health conditions in this country.

2. Coleman, Warren, and DuBois, E. F.: The Influence of the High-Calory Diet on the Respiratory Exchanges in Typhoid Fever, Arch. Int. Med., August, 1914, p. 168.

3. Shaffer, P. A., and Coleman, Warren: Protein Metabolism in Typhoid Fever, Arch. Int. Med., December, 1909, p. 538. DuBois, E. F.: The Absorption of Food in Typhoid Fever, ibid., September, 1912, p. 177. Coleman, Warren: The High-Calory Diet in Typhoid Fever, a Study of 111 Cases, Am. Jour. Med. Sc., 1912, cxliii, 77; Weight Curves in Typhoid Fever, ibid., 1912, cxliv, 659; Diet and Metabolism in Fever, Tr. XV Internat. Cong. on Hyg. and Demog., Washington, 1912, ii, 602.

THE ODOR OF THE URINE—"URINOD"

The odor of the urine is *sui generis*. When the secretion from the kidneys is freshly voided it is comparatively odorless in distinction from the condition that develops on standing. Numerous known volatile substances have been described to occur in the urine both normally and under exceptional circumstances. Some of them are not free at first, but are gradually liberated by the chemical changes which may arise in the voided fluid. Known exceptional substances which have their origin in the diet or therapeutically administered materials are not included here. Drs. Dehn and Hartman[1] of the Chemical Laboratory at the University of Washington in Seattle have set up the thesis that hitherto known volatile substances of the urine are not responsible for its characteristic odor. Some of these, as ammonia, indol and possibly phenols, contribute to the composite nature of the odor. Dehn and Hartman believe that they have discovered the product which imparts to all urines their characteristic odor and which has apparently been overlooked by previous investigators. The newly found substance, which they name urinod,[2] occurs to the extent of only 1 or 2 parts in 100,000 parts of urine. This fact is made to account for the failure of a previous recognition and also indicates why the search for it has been so laborious. Quantities of urine as large as 1,000 liters (quarts) were manipulated in attempting to isolate the urinod. As a result a neutral, ill-smelling substance, with the empiric formula C_6H_8O, has been separated from the fluid. Its structural formula has even been suggested, and we are told that it occurs in urine in the conjugated form and is set free by fermentation. Urinod seems to be excreted in all samples of urine, and since it is found constantly, like urea, uric acid, etc., the discoverers believe that it must bear some relation to metabolism. According to Dehn and Hartman, the odor of urine, though largely caused by urinod, is blended with basic, acidic, phenolic and other neutral compounds, under different conditions of alkalinity, acidity and neutrality. Since urinod is not found in fresh urine in the free state, its offensive odor is not developed unless urine is permitted to ferment, is evaporated or ignited, is treated with acids or alkalies, or is secreted under pathologic conditions. It is well known that urea and other urinary compounds occur in small quantities in perspiration; and it is now suggested that some derivative of the newly heralded urinod or the urinod itself may also be excreted by the skin. The product is said to resemble the so-called body odor and may thus be a factor in the composite odor of ill-ventilated rooms occupied by man.

1. Dehn, W. M., and Hartman, F. A.: The Volatile Substances of Urine, Jour. Am. Chem. Soc., 1914, xxxvi, 2118.

2. Dehn, W. M., and Hartman, F. A.: Urinod, the Cause of the Characteristic Odor of Urine, Jour. Am. Chem. Soc., 1914, xxxvi, 2136.

THE INFECTIONS ON IMMIGRANT SHIPS

Under present regulations, ships having on board such diseases as scarlet fever and measles are not held at the maritime quarantine stations. Williams[1] says this is especially unsatisfactory with reference to immigrants arriving by sea, among whom the children often develop infectious diseases while on shipboard. Many persons are then exposed to the contagion, are landed and later develop these diseases in communities to which they go. Of the immigrants arriving at Ellis Island, for instance, many (in 1913, 87 per cent.) land and proceed at once to their destinations. Among those detained for various reasons it is found that infectious diseases frequently develop, a majority falling ill within the period of incubation of these diseases as calculated from the date of landing, indicating that they were infected on shipboard. These outbreaks occur so regularly that it seems reasonably certain that the same thing happens among those not detained. For the year ended June 30, 1913, out of 834 patients with measles admitted to the Contagious Disease Hospital at Ellis Island, 576 were taken from ships on the day of arrival, and 258 additional cases developed among detained immigrants subsequent to arrival. Of the latter number, 167 fell ill within a period after arrival indicating that they had been infected on board. These 167 cases developed among the 13 per cent. of immigrants detained. At the same rate among the 87 per cent. not detained there would have occurred 1,117 cases of measles, distributed wherever these immigrants scattered themselves, each case becoming a possible focus for the further spread of the disease. Fifty-six cases of scarlet fever developed among the 13 per cent. of detained immigrants, which, with a like calculation, would give 375 cases among the 87 per cent. of those not detained. The possibilities of the spread of these dangerous infections from this source are therefore great. Williams suggests as a remedy the proper isolation and handling of the cases on board ship, which is not at present carried out. Of the 576 cases of measles referred to, only 70 per cent. were "manifested" on the ship surgeon's report, while the other 30 per cent. were discovered only on examination at Ellis Island.

THE ASSIMILATION LIMIT FOR GALACTOSE

We have repeatedly urged caution in the strict interpretation of chemical tests for functional disorder in all cases in which the physiologic basis of the reaction involved was not yet clearly understood and the character of the response admittedly far from specific for the disturbance under observation.[2] Among recent methods in this field of clinical examination the determination of tolerance to different sugars has come into vogue. Glucose, levulose and galactose each has had its turn, and criteria of dosage have become established for each sugar. Thus 100 gm. of levulose or 40 gm. of galactose, respectively, have been employed of late in determining the tolerance of individuals in cases of suspected disease in which the assimilation limit for these carbohydrates is known to be depressed by some associated disturbance of function. In Goldscheider's polyclinic at the University of Berlin, Hoffmann[3] has reinvestigated the tolerance of human subjects for galactose, not only observing the excretion of sugar in the urine as an index of the limit, but likewise examining the sugar content of the blood and thus making use of the most recent of the methods of ascertaining the behavior of carbohydrates in the organism. On the basis of his findings he has concluded that in man the normal limit of tolerance for galactose is decidedly lower than it has hitherto been placed. He gives 15 gm. as a lower figure in place of 40 gm., originally proposed by Bauer[4] in von Neusser's clinic. This might seem like an inconsequential matter were it not true that estimation of the onset of alimentary galactosuria is actually being used for diagnostic purposes by some American clinicians at the present time. It is, therefore, highly important that the norm in the phenomenon should be correctly ascertained.

HEALTH BOARDS AND THE TAXPAYER

Appropriations for health purposes in many communities have in the past been granted reluctantly, and in most instances in insufficient amounts for effective work. It has been difficult to convince the taxpayer and the public official that there would be an adequate return for money expended. Health to them has seemed an individual matter, and health boards have been compelled to beg for every dollar. An improvement, however, is taking place, and the amount per capita of health appropriations is increasing. A more intelligent understanding of the objects of public health expenditures and of the returns to be had is developing. In some instances, the taxpayer is now on the other side of the proposition. He demands of the health board, having approved liberal appropriations, that it prevent epidemics which endanger the health and lives of himself, his family and his friends. Spartanburg, S. C., has been for several years a center for the study of pellagra by a scientific commission. This has no doubt promoted the study of health matters in general in that community, with the result that the local health service has been well supported, while the people have come to recognize the possibilities of disease prevention. With the idea in mind of the seasonal recurrence of certain infectious diseases, the Spartanburg *Herald* says:

> For the amount of money the citizens of Spartanburg are putting up these days for the public health department they have reason to expect service and results. . . . Just at this season of the year and a little later on, in February and March, most cities are visited by . . . scattering cases of diphtheria and epidemics of measles and whooping-cough. Measles and whooping-cough usually spread until they have exhausted the supply of youngsters who have come on since

1. Williams, L. L.: A Leak in Quarantine: Stricter Measures Needed on Immigrant Ships, Survey, Dec. 12, 1914, p. 291.

2. Compare The Significance of the Starch-Digesting Enzyme of the Urine, editorial, THE JOURNAL A. M. A., Dec. 26, 1914, p. 2295.

3. Hoffmann, E.: Die Toleranz gegen Galaktose in der Norm und während der Menstruation, Ztschr. f. exper. Path. u. Therap., 1914, xvi, 337.

4. Bauer, R.: Wien. med. Wchnschr., 1906, xxi, 2537; Deutsch. med. Wchnschr., 1908, No. 35; Wien. klin. Wchnschr., 1912, p. 939.

the last year's epidemic, while diphtheria, because of its more violent character, is usually held in check. But the question in our mind is whether these things have to be. In modern days is there no way to prevent so much suffering and sickness on the part of the little children of a city? The Spartanburg health authorities could in no way carry their services nearer the homes of the people than by making a study of this question and taking every precaution possible to hold these things in check this year.

It goes without saying that the health board of Spartanburg will do its utmost, but this change of attitude of the taxpayer toward disease prevention is interesting and hopeful. It also emphasizes the obligation on the part of health departments to make good.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST; SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

ALABAMA

Hospital Dedicated.—The Hospital erected by the Order of the Eastern Star at the State Masonic Home near Birmingham, was dedicated with formal ceremonies, December 2.

Personal.—Dr. Daniel T. McCall has been elected president, and Dr. Harry T. Inge, vice-president of the Mobile City and County Tuberculosis Sanatorium, the organization of which was perfected December 20.——Dr. John Kimbrough, Jr., Mobile, has been commissioned First Lieutenant, M. C., Ala. N. G.

Health Campaign of State and Local Boards of Health.—Dr. Frank V. Meriwether, Gantt, of the State Board of Health, in cooperation with the Lawrence County Board of Health, conducted a health campaign in that county in December, giving stereopticon lectures on typhoid, pellagra and hookworm and a free examination followed by free treatment of hookworm. A large number attended the lectures and took advantage of the treatment.

ILLINOIS

Transfer Insane to New State Hospital.—Thirty-five patients have been transferred from the Anna State Hospital to the new Alton State Hospital, and are quartered in a farm house which has been remodeled and fitted for that purpose.

All Things in Common.—It is reported from Macomb that the physicians of that city have rented a portion of an office building and are attempting to work on a cooperation basis, the instruments of each to be of service to others. They will also place the knowledge of each at the disposal of others, and patients will enjoy the advice and consultation of all, at no additional expense.

Personal.—Dr. Lemuel B. Short, health commissioner of East St. Louis, has also been appointed city physician.——Dr. Harry O. Collins has been appointed a member of the staff of St. Mary's Hospital, Quincy.——Dr. Otis Johnston, Quincy, fell on the ice, December 30, spraining his right ankle.——Dr. Alden E. Smith, Freeport, has been elected president and Dr. Sara E. Hewetson, Freeport, secretary, of the Stephenson County Antituberculosis League.——Dr. William G. Schmidt, Quincy, is reported to be critically ill.

Chicago

Medical Women Hear Coroner.—At a meeting of the Medical Women's Club, January 13, Coroner Peter M. Hoffman of Cook County delivered an address on "Public Safety."

Tuberculosis Advisory Committee Appointed.—On December 21, the president of the Board of Cook County Commissioners appointed the following advisory committee for the tuberculosis hospitals of Cook County: Drs. Theodore B. Sachs, Ethan A. Gray and Stephen R. Pietrowicz, and Mr. James Minnick.

To Study Defective Children.—At a meeting of the Board of Education, January 6, a committee was appointed, consisting of Drs. Peter C. Clemensen, O. F. Warning and Stephen R. Pietrowicz, to cooperate with Daniel P. MacMillan, director of the Child Study and Educational Research Department, to assist that department in the scientific study of the defective child.

Personal.—On January 7 twenty-five members of the staff of the Illinois Charitable Eye and Ear Infirmary, Chicago, gave a farewell dinner to Charles T. Gerrard, superintendent of the institution for the last sixteen years. Dr. Norval H. Pierce presided as toastmaster, and a silver loving-cup was presented to Mr. Gerrard by Alderman Dr. Willis O. Nance. Dr. James L. O'Connor has succeeded Mr. Gerrard as superintendent of the institution.——The Illinois Society of St. Andrew, at its annual meeting January 8, reelected Dr. John A. McGill president.

INDIANA

Hospital Incorporated.—The Indianapolis Eye, Ear, Nose and Throat Hospital was incorporated with a capital stock of $10,000. It is the outgrowth of a medical clinic which has been conducted for some time at the Hillside Christian Church.

Tuberculosis Foes Meet.—At the annual meeting of the Fort Wayne Antituberculosis Society, December 30, Dr. Eric A. Crull was reelected medical director and Drs. Charles G. Beall, Adam L. Schneider, Hermann A. Duemling, Eric A. Crull and Edmund M. Van Buskirk were elected members of the executive committee.

Whole-Time Health Officers.—The Indiana Federation of Clubs has petitioned the state legislature to pass a law requiring all health officers to be trained officials, giving their entire time to the work and providing that they be placed under civil service rules so that they may not be removed under political reasons.

Personal.—Dr. Brown S. McClintic, Peru, on duty with the Russian Red Cross, is now stationed at Kiev.——Dr. Norman E. Jobes, former superintendent of the Indianapolis City Hospital, has been given a verdict by the appellate court for $2,450 against the city of Indianapolis for services rendered as superintendent for the Hospital for Contagious Diseases.——Dr. Charles Bowman, New Albany, is reported to be critically ill at his home.——Dr. Louis Burckhardt has resigned as a member of the attending staff of the Indianapolis City Hospital.——Dr. Henry W. Gante, Anderson, who has been seriously ill with diphtheria, is reported to be improving.

KENTUCKY

Medical Club Incorporates.—The Louisville Medical Club filled out articles of incorporation December 11, and the officers named on the papers are: Drs. Peter S. Ganz, president; Michael Casper, vice-president; Arthur M. Barnett, secretary, and Bernard J. Lammers, treasurer, all of Louisville.

Thousands for Sanatorium.—The executive committee of the Louisville Antituberculosis Association reports that by its sale of Christmas seals in the interest of Hazelwood Sanatorium, $3,000 has already been received and it is believed that $2,000 additional will be raised before the conclusion of the campaign.

Personal.—Dr. Milton Board, Louisville, has been appointed registrar of vital statistics of the Louisville district, succeeding Dr. William E. Gary.——Drs. Lewis S. McMurtry, Louisville; Hugh N. Leavell, Louisville, and William E. Gardner, Lakeland, have been appointed members of the Jefferson County Board of Health.——Dr. Jesse I. Whittenberg, Louisville, has been elected health officer of Jefferson County, vice Dr. Benjamin W. Smock, deceased.——Dr. John M. Morris, Louisville, fractured his right arm January 1, while cranking his automobile.——Dr. Richard B. Cassady, LaGrange, is reported to be seriously ill with jaundice.

MAINE

School Medical Inspection.—During the first year of the act providing for the appointment of school physicians, 49 were employed and 87,000 children were given the tests as to sight and hearing. During 1914 examinations were more generally and effectively given and 114,529 children were given the same tests with the result that 11,980 were found to have defective vision, 44 being totally blind and 3,673 having defective hearing. During the year, 52 school physicians were employed, at an average cost of less than $100.

Physicians in State Legislature.—Twelve physicians of the state have been elected members of the seventy-seventh legislature. Of these, five are in the Senate, Drs. Aaron J. Fulton, Blaine; Alonzo M. Garcelon, Lewiston; Harry M. Multon, Cumberland Center; G. Gilmore Weld, Oldtown, and Wallace N. Price, Richmond. The medical members of the house of representatives are Drs. Richard T. Leader, Lewiston; Albert W. Plummer, Lisbon Falls; Augustine B. Libby, Smyrna Mills; Isaac D. Harper, South Windham; Elmer J. Morrison, Bar Harbor; Cecil E. Wasgatt, Deer Isle, and Adelbert Millett, Belfast.

MASSACHUSETTS

Harvard to Have Hospital Unit in Paris.—Harvard University has raised about $10,000 to equip and maintain a hospital unit at the American Hospital, Paris, to assist in caring for the wounded in the war. The unit will consist of two resident surgeons, three interns, two operating nurses and two anesthetists.

Tuberculosis Hospital Dedicated.—On January 2 the Carter Memorial Tuberculosis Hospital at Lancaster erected according to the wishes of Miss M. Elizabeth Carter in memory of Charles M. and Martha Howard Thurston Carter, was formally dedicated and the keys were presented to the Clinton Hospital Association. Addresses were made by Governor Walsh and Dr. Walter P. Bowers, Clinton. After the exercises the hospital was opened for inspection by the public.

Mental Hygiene Society Organized.—The Massachusetts Society for Mental Hygiene has been organized with the aim of educating the people as to the real cause of the disease and to give instructions in plain and tested measures for the prevention of mental diseases, the officers of which are: Hon. Harvey H. Baker, Boston, president; Dr. Walter E. Fernald, Waverly, vice-president; Dr. Charles E. Thompson, Gardner, secretary; John Keran, Boston, treasurer, and Dr. Frankwood E. Williams, Boston, executive secretary.

Personal.—Dr. Richard P. Strong, professor of tropical medicine in Harvard Medical School, has been appointed director of hospitals, laboratories and research work of the United Fruit Company. His new field of labor will be in the West Indies and Central and South America.——Dr. John J. Dowling, Boston, has been appointed superintendent of the Boston City Hospital, to take effect January 31, vice John H. McCollom, Boston, resigned. Dr. McCollom has been connected with the hospital for 46 years.——Dr. William J. Sullivan has been appointed city physician of Lawrence, vice Dr. George W. Dow——Dr. Charles J. Downey, Springfield, has been named as trustee of the state hospitals for consumptives.

Hospital Efficiency.—On January 6 a meeting for the discussion of hospital efficiency was held at the Boston Medical Library under the auspices of the surgical section of the Suffolk District Medical Society. The general subject of discussion was on whom the responsibility for medical and surgical efficiency, in a charitable hospital, should rest and the general consensus of opinion appeared to be that the responsibility would be vested in a committee composed of representatives of all departments, namely, the trustees, the staff, and the administration. The subject was discussed by Mr. Frank B. Gilbreth, Providence, R. I., from the standpoint of an efficiency expert; by Dr. Robert L. Dickinson, surgeon and gynecologist to the Brooklyn Hospital, from the standpoint of a hospital surgeon; by Dr. Herbert B. Howard, superintendent of the Peter Bent Brigham Hospital, from the standpoint of a hospital superintendent; by Drs. Walter Wesselhoeft of the Massachusetts Homeopathic Hospital and Joel E. Goldthwait of the Peter Bent Brigham Hospital, from the standpoint of hospital trustees, and by Major James M. Curley, from the standpoint of a public servant.

MISSOURI

Centralia Physicians Organize.—The Centralia Medical Association was organized, December 17, with Dr. William A. McAllister, president, and Dr. Orpheus B. Mayes, secretary, both of Centralia.

Colored Medical Association Incorporated.—A pro forma decree of incorporation has been issued at St. Joseph to the Missouri Pan Medical Association, whose officers are: Dr. J. E. Perry, Kansas City, president; Dr. R. Leon Hall, secretary; and Dr. William S. Carrion, treasurer.

Physicians' Club Leases Quarters.—The recently organized Physicians' Club of Springfield has leased space on the third floor of the Woodworth Building as its headquarters. There is one large room, which will seat more than 100 persons, where the meetings of the club will be held, and a smaller room, which will be used as a library and rest room. It is the purpose of the club to invite the Greene County Medical Society to meet with it.

Advise Reorganization of Hospital.—The special committee of the Jackson County Medical Society, consisting of Drs. Edward W. Schauffler, Francis M. McCallum and Andrew W. McAlester, Jr., all of Kansas City, appointed to investigate conditions of the General Hospital, made its report January 4, advising a thorough reorganization, closing with the following words: "This committee begs to be discharged until such time as the medical profession determines to take a positive stand for right and justice to itself and to the public in the administration of this public institution."

Personal.—Dr. Walter S. Wheeler, health commissioner of Kansas City, underwent operation at Wesley Hospital, January 4, and is reported to be doing well.——Dr. George A. Nash, Maryville, who was operated on December 14 for appendicitis, is said still to be in a serious condition.——Dr. William H. Hays, Hannibal, whose leg was amputated as the result of a gunshot wound while on a hunting expedition, is now out of danger.——Dr. Stephen D. Reynolds, Gower, has been appointed a member of the staff of the State Hospital No. 3, Nevada, vice Dr. Charles B. Simcoe, deceased.

The Missouri Foundation for Health Conservation, St. Joseph, Mo.—On December 21, the secretary of state of Missouri issued articles of incorporation to "The Missouri Foundation for Health Conservation," the purposes of which are "the conservation of health and the prevention of disease to the end that human efficiency may be increased and human suffering prevented." Its purposes are to be secured by any means "that demands of time or of science may require." The first activity undertaken will be a medical laboratory to be established at St. Joseph, with its tributary population of 1,000,000. It is intended that this institution shall be a clearing-house where all doctors living in the country tributary to St. Joseph may send specimens from patients for analysis and get prompt returns. The work will be financed by fees, donations, subscriptions and bequests, its aims being scientific, social and benevolent and not commercial. In addition to the medical laboratory, other activities for health conservation will be inaugurated. The secretary of the foundation is Dr. Daniel Morton, St. Joseph, and the members of the board of control are prominent citizens of St. Joseph and the state.

St. Louis

Auditorium Dedicated.—The Auditorium of the St. Louis Medical Society has been rededicated as the Hugo W. Bartscher Memorial Hall, on account of the bequest made to the society by the will of Mrs. Bartscher. An oil painting of Dr. Bartscher will be hung in the hall.

Hospital Quarantined.—On account of eight cases of smallpox at the Lutheran Hospital, the institution has been placed under quarantine. The inmates have been ordered to be vaccinated. Six persons suffering from small-pox were removed from the institution to the Koch Hospital, January 6.

Personal.—Dr. Malcolm A. Bliss, while crossing the street January 6, was knocked down by a motorcycle and seriously injured.——Dr. Leo Loeb, pathologist to the Barnard Free Skin and Cancer Hospital, has resigned, to take effect April 1.——Fire in the house of Dr. William E. Sauer, December 14, did damage to the extent of about $1,000.——Dr. Percy Carroll, a member of the staff of the City Hospital, was operated on for appendicitis, December 21.——Dr. John Young Brown bought a 30-acre tract near Baldwin, Mo., as a site for his country home.

NEW YORK

A Primer for Mothers.—The Buffalo Department of Health has issued for free distribution a four-page "Primer for Mothers," giving general rules for the management of infants.

Scarlet Fever in Children's Home.—An outbreak of scarlet fever is reported from the Cripples Home of St. Giles near Garden City, L. I. The cases are mild and there is little apprehension of serious developments.

Deporting Alien Insane.—Although the work of deporting alien insane has been greatly hampered by the war, there were returned to their native countries either at the expense

of the state or of their friends last year 426 alien insane, who had resided in this country for a period of over three years, and who were not deportable under the provision of the immigration law. The number returned to Europe during the previous year was 486.

New York City

New Maternity Hospital Opened.—The Bronx Maternity Hospital Clinic was formally opened January 4 and is now ready for the reception of patients. This is the first maternity hospital established in the Bronx and is entirely the result of private charity.

Harvey Society Lecture.—The sixth lecture of the Harvey Society series given at the New York Academy of Medicine, January 16, is by Dr. Edward R. Baldwin of the Adirondack Cottage Sanatorium, Saranac Lake, on "Immunity in Tuberculosis with Special Reference to Racial and Clinical Manifestations."

Personal.—Dr. James M. Wicks of Jamaica, L. I., who has been working for three months in the American Ambulance Hospital at Paris, has returned to this country.——Dr. Charles F. Stokes, Washington, D. C., Surgeon-General of the Navy under the Roosevelt and Taft administrations, has been appointed superintendent of the city farm colony for inebriates in Orange County.

Drug Arrests.—A special report made to Police Commissioner Woods shows that in 1914, 1,950 arrests were made by the special squad which was organized to break up the illicit sales and distribution of drugs and narcotics. It is said that in 1913 there were 511 arrests on similar charges. In 1914 there were 947 convictions secured as against 256 in 1913. The report is said to show a great improvement over previous conditions.

Hungry Schoolchildren to Be Fed.—Beginning January 11, twenty-four restaurants will be started in the public schools of the greater city. Superintendent Maxwell announces that he has at present $9,000 with which to start the project, and Andrew Carnegie has promised $2,000 provided an additional $10,000 is raised. A portion of any article on the menu will be furnished to a pupil at one cent and free tickets will be distributed to those unable to pay.

New York Leads in Tuberculosis Fight.—The annual statement of the National Association for the Study and Prevention of Tuberculosis shows that during the past year more than $20,500,000 was spent in the tuberculosis campaign in this country, and that New York has spent more during the past year than any other two states. Illinois has second place. The statement also shows that 66 per cent. of the money was derived from public funds, either federal, state, county or municipal, while the remainder was contributed by private philanthropy.

Academy of Medicine Meeting.—The annual meeting of the Academy of Medicine was held on January 7, at which time the reports of the officers and committees of the academy were presented. The treasurer's report shows the academy in a thriving condition financially. The trust funds now total $687,090. The most interesting report was that of the public health, hospital and budget committee which shows the wide variety of activities in which the academy is interested. The executive session was followed by the retirement of the president, Dr. William M. Polk and the inauguration of his successor, Dr. Walter B. James.

NORTH CAROLINA

Nurses' Home.—The Presbyterian Hospital, Charlotte, has leased a building adjoining the hospital for use as a nurses' home.

Free Clinic.—A free clinic has been established at the Spencer Sanitarium, Winston-Salem, with the cooperation of fifteen or twenty physicians of the city. The clinic will be opened from 12 to 2 p. m., Mondays and Saturdays being set aside for colored patients.

Personal.—Drs. George W. Purefoy and Marshall H. Fletcher have been reappointed members of the Buncombe County Board of Health.——Dr. Thomas W. M. Long, Roanoke Rapids, has been appointed a director of the Eastern Hospital for the Insane, Raleigh.

New Buildings for School for Feeble-Minded.—The trustees of the North Carolina School for Feeble-Minded, at the annual meeting held in Kington, recommended an extension of the institution including three buildings and involving an expenditure of $120,000. Dr. C. B. McNairy, was reelected superintendent of the school.

Whole-Time Health Officers.—At the January meeting of the board of aldermen of Winston-Salem, it was voted to organize a complete health department for the city and to secure the services of a competent whole-time health officer. ——The commissioners of Pitt County, at the January meeting, held in Greenville, voted to establish a whole-time county health officer.

PENNSYLVANIA

Personal.—Dr. S. Albert Blair, Chambersburg, has been appointed chief surgeon of the Hospital for Diseases of the Eye, Ear, Nose and Throat, recently opened at Scranton.——Dr. Henson F. Tomb, Johnstown, who was operated on December 23, at the Memorial Hospital, Johnstown, for cholecystitis, is reported to be making good progress toward recovery.

Decrease in Contagious Diseases.—Communicable diseases in Pennsylvania during 1914 were 50,000 less than the number in 1913, according to a statement issued December 31 by Dr. Samuel G. Dixon, commissioner of health. Typhoid fever decreased 70 per cent. The general death-rate was only 14.1 per 1,000 inhabitants. Tuberculosis was reduced, and cancer was the only disease which showed an increase.

Vindication of Physicians.—In a suit brought by Mrs. Ella E. Caldwell of Indiana, against Drs. William A. and George E. Simpson of the same town, alleging that they fraudulently, knowing the plaintiff was not insane, signed an insanity certificate committing her to the Pennsylvania Hospital for the Insane, Philadelphia, the trial judge gave a strong charge in favor of the defendants, who were promptly acquitted.

Philadelphia

Rush Society Lecture.—A change has been found necessary in the program for the Ninth Rush Society Lecture, January 23 next, as Professor Umber of Berlin has found he would be unable to come, because of the war. Dr. Lafayette B. Mendel of Yale University will speak on "Nutrition and Growth."

Personal.—Dr. Richard H. Harte, director of public health and charities, resigned January 6.——Dr. S. Lewis Ziegler has been appointed director of public health charities to succeed Dr. Harte.——Dr. Charles W. Burr has been appointed consulting neurologist to the Municipal Hospital. ——Dr. Howard Kennedy Hill was reelected chairman of the track committee of the University of Pennsylvania, December 21.

Graduate Nurses to Help War Hospitals.—Graduate nurses, meeting at the call of chairman of the Red Cross division of the Emergency Aid Commission, organized December 8 a corps of workers for the manufacture of bandages and other surgical supplies for use on European battle fields.——The "Made In America" Bazaar Committee has $4,000 to turn over to the Red Cross division and a like sum to the Belgium Relief division.

School for Tuberculous Children Open.—Twenty children suffering from symptoms of tuberculosis began school in an open air class-room provided by the board of education, January 4. A small building on the Girard School property at Eighteenth and Snyder Avenue has been thoroughly repaired and improved by the department of buildings. The building is provided and equipped with a kitchen and dining room and philanthropic agencies have been asked to help to start a lunch room. The children will be expected to pay but none will be refused food.

Wet-Nursing Bureau.—The Babies' Welfare Association has organized a central bureau of information concerning all agencies in the city which are conducted for the welfare of infants. Among its other activities the association is attempting to put into operation a plan for the centralization of wet-nursing in the Bureau of Health. The central office has a registry for wet nurses desiring positions, as well as one for physicians who wish the services of wet nurses. Every candidate for wet-nursing is required to present a certificate of general physical fitness. No candidate is considered available until the Wassermann test has been submitted to and the result of the examination has been returned negative.

GENERAL

Revenue Cutters to Carry Surgeons.—An order has been issued by the Secretary of the Treasury that each revenue cutter engaged in winter cruising on the Atlantic Coast, shall carry a surgeon of the Public Health Service. This action is in addition to that noted last week in THE JOURNAL

of the equipment of the Revenue Cutter *Androscoggin* as a hospital for sick and injured fishermen.

Memorial for Theobald Smith.—On account of the impending severance of his connection with Harvard University after a service of twenty years, the colleagues of Professor Theobald Smith are arranging for a permanent memorial. It is proposed to present a bas-relief of Professor Smith to the medical school and reductions of this will be made and presented to each donor of $10 or more to the fund. A complimentary dinner is to be given to Professor Smith on April 17, the cost of which will be $5 per cover. Subscriptions should be sent to Dr. Marshall Fabyan, 379 Commonwealth Avenue, Boston, not later than February 10.

Bequests and Donations.—The following bequests and donations have recently been announced:

The Episcopal Hospital, Philadelphia, $10,000 by the will of John Dobson.

Germantown Dispensary, $2,100 by the will of Margaret McLain.

Chestnut Hill Hospital, Philadelphia, $1,000; Howard Hospital, Philadelphia, $22,000 by the will of Anna F. Brush.

Harvard Medical School, $50,000 for the endowment of a chair of gynecology to be known as the William H. Baker Chair of Gynecology, by the will of Dr. William H. Baker, of Waltham, in the event of Harvard Medical School not desiring to accept the bequest under the conditions named, it is to be turned over to the Free Hospital for Women, Brookline.

Philadelphia County Medical Society, for its beneficent activities, $5,000 by the will of Dr. Louis A. Duhring.

New York Infirmary for Women and Children, $6,000; State Charities Aid Association, $25,000 by the will of Grace Hoadley Dodge.

Plague Work in New Orleans.—Up to December 26, the public health officials, engaged in work against the bubonic plague in New Orleans, report that 205,872 rodents had been captured, 178,421 of which had been examined. Of these, 213 were found to be infected. The infected rats by species were as follows: Mus Rattus, 11; Mus Musculus, 1; Mus Alexandrinus, 5, and Mus Norvegicus, 196.——During the week ended January 2, 17 vessels were fumigated with sulphur; 14 with carbon monoxid and 2 with hydrocyanic gas; 26 clean bills of health and 12 foul bills of health were issued; 237 cars were inspected and 9,359 rats were trapped; 5,092 rodents were examined out of 9,481 received at the laboratory and of these, 43 were suspicious and in 6 cases the diagnosis of plague was confirmed. Up to the present time 219 plague rats have been discovered.

Gorgas Medal Established.—The Gorgas Medal to be given yearly in honor of Surgeon-General Gorgas has been established by the Medical Reserve Corps, U. S. Army, New York State Division. This medal is open to competition to members of the Medical Corps of the United States Army, the Medical Reserve Corps of the United States Army and to members of the medical corps of the organized militia. Officers may submit papers on any subject of a medico-military nature. General Gorgas has appointed the following board of officers to act on papers submitted: Colonel Charles Richard, Lieut. Col. Champe C. McCulloch, Jr., and Major Eugene R. Whitmore, Army Medical Corps. These officers are members of the faculty of the Army Medical School and will have sole authority to appoint the time that papers are to be submitted, and to pass on the merits of the papers. All inquiries should be addressed to one of these officers.

Inspection of Schoolchildren in Canal Zone.—District physicians have been instructed to follow up the cases of all children found infected in the physical examination recently given to pupils in the Canal Zone public schools. After the expiration of thirty days, the physicians are to advise the chief health officer what percentage of those previously found infected report for treatment, together with results obtained. Teachers have been requested to inform the district physician when pupils have been absent for unknown causes, in which case the physician will visit the homes of pupils and institute such measures which may be deemed necessary.——District physicians, together with the health officers of Panama and Cristobal-Colon, have been instructed to visit all schools in their respective districts and to vaccinate all pupils who have not had small-pox, or who have not been successfully vaccinated within the last five years, issuing certificates to all pupils and teachers whom they vaccinate.

State Child Welfare Exhibits.—Plans are under consideration involving the cooperation of the state departments of health, charities, education, labor, etc., for the holding of child welfare exhibits, under the direction of the extension divisions of the state universities. Among the states having the plan under advisement are Indiana, Arkansas and Oklahoma, and Wisconsin, Missouri, Nebraska, Kansas, Iowa and Minnesota have decided on exhibits and are awaiting organizers from the National Child Welfare Exhibit Association. The exhibits would comprise the propaganda work of the various state departments named as it affects children, with the object of showing constructively what is being done for the children by the various states and what it is necessary to do. In the past few years successful exhibits have been held in the larger cities, and the idea has been taken up by various cities abroad. The experience of the United States was called on in preparing these latter exhibits. Charles F. Powlison, 200 Fifth Avenue, New York City, is secretary of the National Child Welfare Exhibit Association. He seeks correspondence with and cooperation of experts in various lines of child-helping.

Conferences on Medical Education, Legislation and Licensure.—During the three days February 15, 16 and 17, there will be held at the Congress Hotel, Chicago, a series of conferences on medical education, medical legislation and the licensing of physicians. On Monday, February 15, the Council on Health and Public Instruction of the American Medical Association will hold its regular annual conference. The program follows:

1. Call to order by the Chairman, Dr. Henry B. Favill.
2. Chairman's Address.
3. Secretary's Report.
4. Report of the Committee on Medical Expert Testimony. Prof. E. R. Keedy.
   Discussion:
   Dr. Harold N. Moyer.
   Prof. John H. Wigmore, Chicago.
   Judge Albert C. Barnes, Chicago.
   Judge Harry Olsen, Chicago.
5. Presentation and Discussion of Bill for the Prevention of Ophthalmia Neonatorum.
6. Model Bill on State Public Health Organization. Dr. Henry M. Bracken, St. Paul.
   Discussion:
   Dr. J. N. Hurty, Indianapolis, Ind., Secretary State Board of Health.
   Dr. S. J. Crumbine, Topeka, Kan., Secretary State Board of Health.
   Dr. George B. Young, Commissioner of Health, Chicago.
   Prof. Charles Henderson, University of Chicago.
   President George Vincent, Minnesota State University.
7. State Regulation of Those who Treat the Sick. Hon. G. H. Hodges, Governor of Kansas.
   Discussion:
   Dr. George H. Cook, Natick, Mass., President Conference of State Examining and Licensing Boards.
   Mr. A. C. Umbreit, Milwaukee.
   Dr. A. D. Bevan, Chicago, Chairman Council on Medical Education.

On Tuesday, February 16, the Council on Medical Education will hold its eleventh annual conference. The program follows:

1. Opening of Conference by the Chairman, Dr. Arthur Dean Bevan, Chicago.
2. Report of the Secretary, Dr. N. P. Colwell, Chicago.
3. Report of the Committee on the Reorganization of Clinical Teaching, by the Chairman, Dr. Victor C. Vaughan, President, American Medical Association, Ann Arbor, Mich.
4. Report of the Committee on Graduate Medical Instruction, by the Chairman, Dr. Horace D. Arnold, Dean of the Graduate School of Medicine of Harvard University, Boston, Mass.
   Discussion: Dr. James F. McKernon, President of the Faculty of the New York Post-Graduate Medical School, New York City.
5. Symposium on Higher Degrees in Medicine.
   (a) "The University and Higher Degrees in Medicine," by President George E. Vincent of the University of Minnesota, Minneapolis, Minn.
   Discussion: President Harry Pratt Judson of the University of Chicago, Chicago.
   (b) "Courses and Degrees in Public Health Work," by Dr. Milton J. Rosenau, Professor of Preventive Medicine and Hygiene, Harvard University Medical School, Boston, Mass.
   Discussion from the Engineer's Standpoint—Mr. M. C. Hoad, Professor of Sanitary Engineering, University of Michigan, Ann Arbor, Mich.
   (c) "Preparation of Specialists in Ophthalmology and Oto-Laryngology," by Dr. Frank C. Todd, Professor of Diseases of the Eye, Ear, Nose and Throat, University of Minnesota, Medical School, Minneapolis, Minn.
   Discussion—Dr. Edward Jackson, Professor of Ophthalmology, University of Colorado, School of Medicine, Denver, Colo.
   (d) "Higher Preparation in Surgery," by Dr. John M. T. Finney, Professor of Clinical Surgery, Johns Hopkins University, Medical Department, Baltimore, Md.
6. "A Scheme Facilitating More General Licensure," by Dr. W. L. Rodman, President-Elect of the American Medical Association, Philadelphia, Pa.

On Wednesday, February 17, there will be a joint conference of the Federation of State Medical Boards of the United States and the Association of American Medical Colleges. The program follows:

1. "Some Thoughts on the Work of the State Board of Medical Examiners," John Huston Finley, LL.D., Commissioner Education, State of New York.

2. "Classification of Medical Colleges," Henry S. Pritchett, President Carnegie Foundation.
3. "Fallacies in the Argument Against Full Time Clinical Instructors," Major J. Seelig, St. Louis, Mo.
4. "Minimum Expense of Maintenance of an Acceptable Medical College," Laboratory Department, F. C. Waite; Clinical Department, John L. Heffron.
5. Address of President (subject not announced), Isadore Dyer, New Orleans, La.

FOREIGN

The Prohibition of Absinthe Not Enforced in France.—The recent decree forbidding the sale of absinthe in France failed to forbid renewal of supplies. The saloon-keepers are thus able to keep their stock replenished, and the daily paper, *le Temps*, hints that the clandestine consumption of absinthe is being encouraged by the administration. At a recent meeting of the Société méd. des hôp., a vigorous protest was unanimously voted calling on the authorities to enforce "the regulations against this redoubtable foe in our midst," and make them definitely prohibitive.

Deaths in the Profession Abroad.—The cable brings word of the death of Klaus Hanssen, physician in chief of the Bergen Public Hospital, Bergen, Norway, and leader in the campaign against tuberculosis, aged 71.——S. Gottschalk, privat-docent of gynecology and obstetrics at the University of Berlin, founder of a private clinic, and author of numerous articles on chorio-epithelioma, etc., aged 54.——E. Mairinger and J. Zuckermann, both of Vienna.——The death is also reported of Wilhelm Hittorf, professor of physics at the University of Münster, and not a member of the profession, but Hittorf's work on the cathode rays blazed the way for the discovery of the Roentgen rays.

From Bahia, Brazil.—The professor of histology and chief of one medical clinic connected with the University of Bahia, Prof. Pacifico Pereira, for nearly half a century has been a leading spirit in medical education and public hygiene. He founded in 1866 the *Gazeta Medica de Bahia* and has edited it since. On the occasion of his recent retirement from his chair on account of having reached the age limit, an ovation was tendered him, a festival under the auspices of the medical department, with representatives from scientific societies throughout Brazil and beyond.——The University of Bahia was founded in 1808 but still has only the "faculty of medicine, surgery and pharmacy" as when first founded. It has forty-two professors besides over a dozen assistants, and there were 730 students enrolled in 1913.

Prizes Distributed by the Paris Academy of Medicine.—The Académie de Médecine is the medical department of the National Institute of France, and it has seventy-three endowments for prizes to be awarded in the medical sciences. Of the forty-three available in 1914 and which have just been distributed, fourteen could not be awarded as in the case of the Audiffred prize which offers a capital representing an annual income of $4,800 for a "sovereign remedy against tuberculosis." Of the six articles offered in competition, only one was given "encouragement" with an award of $200 for research on the tubercle bacillus. The Roussilhe prize was awarded for the first time. This is a triennial prize of $2,000 for the "greatest progress in dermatology for the relief or cure of diseases of the skin." Competition is open to all scientists, French or foreign. The prize was given to Professor Gougerot of Paris for his works on skin diseases, especially his research on sporotrichosis. The prize of $200 for the "most meritorious medical student" was given to Mademoiselle Romme. The only one of the prizes ($240) which went out of France was given to H. Fredericq of the University of Liége for his research on the comparative physiology of the circulation. All of the prizes except seven are open to foreign competition. The Académie prize of $200 is offered in 1915 for the best work on diabetic coma; in 1916, on hemoglobinuria; in 1917, on paralysis of the recurrent nerve. The issue of the *Bulletin*, Dec. 15, 1914, contains the conditions and details of the entire list of prizes offered in the next three years.

WAR NOTES

Losses Among the German Medical Officers.—The *Medizinische Klinik*, December 13, says that of the regular army and navy medical corps only one physician has been reported as disabled from sickness since the war began; forty have been severely and 112 slightly wounded; sixty-five have fallen on the field; seventy-eight are missing, and forty-six are known to be in captivity.

Price of Opium in Germany.—Prof. J. Pohl, in an address at Breslau, November 20, commented on the rise in price of opium, saying that the wholesale rate in July was 44 marks and, at the time of speaking, 80 marks per kilogram. This is nearly $37 a pound. He added that this high price was due not only to the fact that importation had ceased, but also to the probability of the next harvest falling short.

Italian Red Cross Hospital at Paris.—There are 100 beds in the hospital organized by the Italian colony in Paris to receive wounded soldiers. The three pavilions form an annex to the Val-de-Grâce military hospital. They were nearly new private houses that have been transformed into a well-equipped modern hospital. The *Policlinico* states that all of the tetanus patients treated there by the Baccelli phenol method recovered.

The Iron Cross for German Physicians.—The *Berliner klinische Wochenschrift* of December 14 states that the Iron Cross has been conferred by the German authorities on 1,500 physicians at the front. The profession rejoices at this appreciation of the devotion of the medical men with the army, especially as it has been less than a year since the medical officers were placed on the same footing in every respect as the other officers in the army and navy.

Aid for Belgian Profession.—The report of the treasurer, Dr. F. F. Simpson, of the committee of American physicians for the relief of the Belgian profession, for the week ending Jan. 9, 1915, lists the following contributions:

E. G. M.	$ 10.00
L. M. W.	5.00
A. T.	10.00
J. G. R. M.	25.00
J. C. T.	25.00
L. C. F.	10.15
E. T. F.	10.15
F. W. S.	10.00
G. L. H.	25.00
G. E. L.	5.00
E. E. K.	10.00
A. M. C. O.	100.00
D. S. M.	10.00
C. M. B.	1.00
M. C. M. S.	25.00
H. M. S.	10.00
E. H. M.	5.00
Total	$296.30
Disbursements	None
Contributions previously reported	$662.50
Grand Total	$958.80

LONDON LETTER

LONDON, Dec. 24, 1914.

The War

THE RED CROSS HOSPITALS IN FRANCE

Sir Frederick Treves, who has returned from a visit of inspection of the Red Cross hospitals in France, has submitted his report to the British Red Cross Society. He speaks highly of the fleet of motor ambulances provided by the society. He thinks it represents the most valuable service ever rendered by voluntary aid to the army medical department. "These ambulances are everywhere. The majority are working at the front in convoys of various sizes. They are perfectly organized and equipped, and are always at work. When they come down with patients they return with stores for the wounded. In the saving of life, in the lessening of suffering, and in the securing of prompt surgical treatment for the wounded these ambulances have done a work the value of which can hardly be exaggerated." In addition to the motor ambulances, the society has many other cars which are of great service in dispatch work and the conveyance of goods. A large number of these have been lent to the society by generous owners. The chauffeur who drove Sir Frederick Treves to Le Touquet was Mr. Kennerley Rumford, the famous singer. Another driver of note is the vicar of a quiet country parish in England.

SERIOUS SHORTAGE OF MEDICAL STUDENTS

The shortage of medical students in consequence of those who have gone to the front as combatants as well as dressers has been mentioned in a previous letter. Actual figures have now been furnished by Sir Donald Macalister, president of the General Medical Council, who finds that the decrease this year as compared with the preceding years is as follows:

first year students, 56 fewer; second year students, 237 fewer; third year students, 237 fewer; fourth year students, 211 fewer; fifth (and higher) year students, 300 fewer. The aggregate number of medical students now pursuing their curriculum with a view to qualification is thus about 1,000 smaller than in 1913. Unless many senior students return to their studies within the next few months, the result will be that the number of young qualified practitioners added yearly to the ranks of the profession will during the next few years be from 200 to 300 less than before. This is equivalent to a diminution of about 25 per cent. of the average number annually added to the medical register on qualification.

AMBULANCE BARGES

Sir Arthur Sloggett, the surgeon-general to the British forces at the front, has approved of and accepted a proposal made by Mr. Douglas Hall, M.P., to procure and equip four ambulance barges for immediate use on the waterways at the seat of war in France and Flanders. As this proposal will entail considerable expense, an appeal to the public for financial assistance has been made. The use of barges as a means of transport for wounded, and as actual hospitals, has been recently tried by Mr. Hall on the Seine, and has met the complete satisfaction of the French authorities and the great gratitude of the wounded for the tranquillity of this means of transport. The unit of four barges asked for in the first instance will be under the direction and control of the Royal Army Medical Corps, which will supply the army surgeons, nurses, and orderlies, and provide a complete floating hospital for 200 wounded

THE BOMBARDMENT OF THE EAST COAST

The figures of the casualties from the bombardment by German ships of the towns on the East Coast now reach 122 killed and 549 wounded.

DEATH OF AN EMINENT BELGIAN NEUROLOGIST IN ENGLAND

The universities of Oxford and Cambridge have freely given hospitality to the refugee Belgian professors and students. Among the former was the distinguished neurologist, Professor van Gehuchten of Louvain, who went to Cambridge, where he died. His work on the anatomy of the nervous system, on staining methods and chromatolysis, and on the olfactory and acoustic nerve tracts, is well known. He was a great clinician and teacher as well as a great investigator.

The Dangers of the Operator: Death of an Eminent Surgeon from Acute Septicemia

Mr. C. B. Lockwood, one of the most distinguished surgeons of the day, contracted acute septicemia after operating on a patient for appendicular peritonitis. The patient was in a grave condition and speed was necessary. Mr. Lockwood pricked his finger when inserting almost the last stitch. He was taken ill the same night and died five weeks later from septicemia. He was surgeon to St. Bartholomew's Hospital, and well known by his writings on aseptic surgery, hernia, varicocele, cancer of the breast, and most of all by his book on appendicitis, which has been described as the ablest exposition of the subject in English. He was not only a great surgeon, but also a master of terse and epigrammatic style. As an example may be taken his expression, "The man who does not pass flatus dies." It is one of the ironies of fate that a few years ago he read at one of the societies a paper on the unusual subject of the dangers to the operator.

PARIS LETTER

PARIS, Dec. 17, 1914.

The War

NERVOUS TROUBLES AMONG WOUNDED SOLDIERS

My army service has permitted me to visit some of the military hospitals and also to examine a considerable number of convalescents after removal to their regimental stations. An especially striking feature is the frequency of nervous troubles, due most frequently to lesions of the nervous centers or of the peripheral nerve but sometimes of psychic origin. In view of the frequency of these complications, it has been decided to form special services under specialists in nervous diseases.

Dr. Paul Sollier of Boulogne-sur-Seine, who has just read a paper before the Académie de médecine on functional paralysis in wounded soldiers, distinguishes four varieties of these paralyses: (1) in emotional subjects, paralysis due to apprehension of the pain caused by moving limbs long kept in an unnatural attitude by apparatus or because of fibromuscular retractions; (2) paralysis due to mental representation (*a*) of movements with loss of the muscular sense and (*b*) of attitudes caused by prolonged disuse of the limbs; (3) paralysis due to a fixed idea of incurability, and (4) paralysis due to hysteric contracture.

Wounds of the nerves of the limbs due to bullets or fragments of shells are frequent, the arms being affected as often as the legs. According to Dr. Henri Claude, who read a paper on this subject before the Société médicale des hôpitaux de Paris, these wounds manifest themselves especially by motor paralyses. The painful forms are rare. Anesthesias are exceptional and particularly characteristic of complete sections of the nerve. What is most frequently observed, even in apparently benign wounds in which the ball merely passes under the skin and heals after a very short period of suppuration, is the sheathing of the nerve in a growth of fibrous tissue which constantly compresses it more closely. The proliferation of this sclerotic tissue causes late paralyses even in cases in which the projectile does not touch the nerve. In such cases operation to liberate the nerve and to surround it with healthy tissue should be performed almost always as soon as suppuration and acute inflammatory reaction have ceased. Mechanotherapy and electrotherapy are indispensable adjuncts of the surgical cure of such cases. From the diagnostic point of view, it is interesting to note that the abolition of the Achilles tendon reflex and of the knee-jerk are early and trustworthy signs of lesions of the sciatic and crural nerves. Investigation of these reflexes is especially useful in subjects inclined to simulation or exaggeration.

Dr. Mauclaire has reported to the Société de chirurgie several cases of motor troubles of psychic origin, taking the form either of paralysis or of contracture, in wounded soldiers whose nervous system had been greatly shaken.

WOUNDS IN BATTLE

Dr. Hartmann of the Faculté de médecine de Paris, who has recently had occasion to observe thousands and to treat hundreds of wounded soldiers, has recently summed up the results of his experience before the Académie de médecine. Of the total number of wounds, those due to artillery projectiles (balls, fragments of shells and of shrapnel) form a large proportion. Out of 268 cases in which the origin of the wound could be determined, 169 were caused by artillery projectiles and 99 by bullets. The frequency of fractures was great—112 cases of fracture out of 311 wounds. In general, these fractures are distinguished from those seen in civil practice by the presence of numerous fragments of bone, by the slight tendency to displacement and by the fact that in limbs with two bones, the lesion is generally limited to one bone. To avoid tetanus, Hartmann recommends that, without regard to the distinction between soiled wounds with fracture and those without fracture or soiling, preventive injection of anti-tetanus serum be practiced in all wounded as soon as possible. To prevent gaseous gangrene the interstitial injections of hydrogen peroxid recommended by Delorme (THE JOURNAL, Oct. 24, 1914, p. 1492) appear insufficient to Hartmann, who recommends liberal opening up of the wound and amputation if the limb is swollen throughout its thickness. In the prevention of gaseous gangrene it is important to remember that this complication never develops in wounds which are well opened up even when they are large. It occurs, on the other hand, in cases of small tortuous wounds deep in the tissues. Treatment, therefore, should consist of opening up the course of the projectile, removing all foreign bodies, draining from end to end, and irrigating with hydrogen peroxid.

At one of the last sessions of the Société de médecine de Paris, Dr. Maurice Cazin reported some interesting statistics comparing the results of early with late hospital treatment. In a group of 158 wounded men received at the hospital less than forty-eight hours after battle, all were cured, in spite of the serious character of many of the wounds. Among the wounded received in hospitals after four or five days of transportation in sanitary trains, on the other hand, the mortality in some hospitals reached 10 or 20 per cent. owing to infectious complications (gangrene and tetanus) which might have been avoided by suitable treatment if the patient had been placed in a hospital early. The objection to early hospital treatment of all wounded soldiers, even those not seriously injured, seems to be the fear of encumbering the hospitals near the battlefield. This might be avoided by selecting twice a week, or even daily, the patients who, after several days under observation with rest and hospital

hygiene and care, are now fit to be removed. Thus men who are on the way to certain recovery and not, as at present, men whose condition is precarious would be removed by hundreds in the trains of evacuation.

EMETIN IN THE TREATMENT OF TRAUMATIC HEMOPTYSIS

In view of the antihemorrhagic properties of emetin in tuberculous hemoptysis, Drs. J. Dupont and J. Troisier decided to try this remedy in traumatic hemoptysis. In three patients with penetrating bullet wounds of the thorax, they gave subcutaneous injections of emetin hydrochlorid, the dose being 40 mg. The hemoptysis was arrested after one or two injections. Of course, emetin injections could not arrest severe vascular hemorrhages but the pulmonary hemorrhages of men who are capable of being transported appear amenable to this simple treatment. If necessary, the dose may be increased to 80 mg.

HOME COMFORTS FOR THE WOUNDED

The Foyer du Blessé has been founded under the patronage of the Assistance publique. The purpose is to bring to wounded soldiers in the hospitals of Paris all possible material comfort and mental consolation and distraction. The director of the Assistance publique has therefore granted the use of a hall in every hospital where this is possible. This hall will be furnished especially for the use of the wounded, who will find there games, books, periodicals, hot drinks, tobacco, letter-paper, a meeting-place and friends who will endeavor to take the place of the absent family and to render the patients all possible service. Two such halls have been in use from the beginning of the war at the Saint Antoine Hospital, and two new ones have just been inaugurated at the Lariboisière.

Deaths in the Profession

Dr. Léon Lereboullet, medical journalist, has just died. He was born in 1842 at Strasburg, where his father held the chair of zoology and comparative anatomy at the Faculté des sciences of that city. In 1873 he was appointed agrégé professor of clinical medicine at the Ecole d' application de médecine et de pharmacie militaires du Val-de-Grâce. In 1881, after publishing a series of articles on the health service of Tunis which attracted much attention, he secured from Jules Ferry, then prime minister, an investigation which finally brought about the autonomy of the health service in the army. Lereboullet was a collaborator of Dechambre from 1872 and finally succeeded him in the editorship of the Gazette hebdomadaire de médecine and of the Dictionnaire encyclopédique des sciences médicales in 100 volumes. Besides the numerous articles on the practice of medicine, on hygiene and ethics, that he published in these two collections, Lereboullet was the author, in collaboration with Mathias Duval, of a manual of microscopy applied to diagnosis and, in collaboration with Dechambre, of a handy dictionary of medical sciences. In 1890 Lereboullet was elected associate member of the Académie de médecine.

Dr. Charles Périer, president of the Académie de médecine, has just died suddenly, aged 78. His health appeared very robust and nothing foreshadowed his approaching death. He presided over the last sessions of the academy and took part in the discussions during the annual public session. He was elected a member of the academy in 1890 in the section of surgical pathology.

Method for Determining the Presence of the Bacillus Typhosus

At one of the last sessions of the Académie des sciences, Drs. Carnot and Weill-Hallé outlined a practical method for discovering the presence of the bacillus of Eberth in typhoid patients and carriers. Instead of looking for the germ as usual in the feces of the patients, Carnot and Weill-Hallé examine the bile, which is known to be an excellent culture medium for this bacillus. The subject to be examined takes 150 c.c. of olive-oil. An hour later the stomach is catheterized, furnishing a mixture of oil, bile and gastric mucus. After separation of the three substances, the bile is examined for the bacillus; often after passage through the incubator it furnishes a pure culture. The Einhorn tube may be used. After it has penetrated into the pylorus, an aspiration by means of a syringe adapted to the tube will remove the bile pure or mixed with pancreatic juice. This procedure furnishes an easy method of establishing the presence of the bacillus during the whole course of the disease and the convalescence. Carnot and Weill-Hallé have found it up to the eighty-sixth day after complete recovery.

BERLIN LETTER

Berlin, Dec. 8, 1914.

The War

WARM UNDERCLOTHING FOR THE SOLDIERS

It goes without saying that, as in all previous wars, the care of the authorities for the sanitary condition of the army has been considerably aided by private generosity. Up to the present the Red Cross has expended about $1,375,000 (5½ million marks) for these purposes, of which more than $500,000 (2 million marks) were given for clothing and equipment of those serving in the army as well as for their instruction and training, about $225,000 (900,000 marks) for the making of woolen goods and other presents, $175,000 (700,000 marks) for hospital trains, and $150,000 for the care of the relatives of soldiers who are at the front. But these efforts of the Red Cross are greatly exceeded by those which have been put forth by various societies and well-to-do citizens. As an example may be mentioned the fact that the "military committee for warm underclothing," formed at the suggestion of the empress, has already sent to the army woolen goods to the value of $3,750,000 (15 million marks). On a certain day of the week special "wool trains" are run regularly to the armies both of the West and of the East. The cargo of these trains frequently reaches a value of $500,000 (2 million marks). Lately wool blankets have been furnished for the troops, who must often lie all day in the firing trenches. From these facts it is quite evident that in many parts of the army a certain oversupply of woolen material has accumulated. Thus in a medical weekly, a staff surgeon confirms the fact that many soldiers suffer from an oversupply of underclothing. There was found, for instance, on a certain artilleryman the following "epithelium": An overcoat, an army coat, a drilling jacket, a woolen vest, two woolen shirts and one linen shirt. As these goods cannot be carried on the wagons, the troops help themselves by carrying along all the pieces of clothing that have been distributed to them. Naturally, a very systematic distribution of the clothing cannot be carried out.

USE OF ALCOHOL IN THE ARMY

In addition to pieces of clothing, the most various articles of equipment have been supplied to the soldiers for their physical comfort. Among these things, alcohol played a rôle for a certain time, although the use of alcohol in the army has been restricted to the minimum by orders of our military medical service. The autumn storms with their cold winds and frequent rainfall aroused the need for warming drinks among the soldiers; therefore alcoholics were furnished to the privates through the express wishes of some of the commanding generals. But immediately warning voices were raised, especially of physicians, who pointed out the objectionable character of the expense for alcohol. By this means a diminution of these presents has been secured. Also some of the leaders of the troops have pointed out in their published reports that the people might well send other articles or gifts rather than alcoholics. Of some aid in this matter is the fact that in the West the cold is very slight. A well-known clinician, who has been spending some time as a consulting internist in the army of the West, and has returned for a few days, has stated that at present there prevail in the West climatic conditions something like those of the Isle of Wight, so that the need for artificial heat, external or internal, is very slight. In the east, naturally, the condition is quite different.

HEALTH OF THE TROOPS

The mild weather has also had a favorable influence on the health of the troops. The number of diseases due to taking cold has been materially reduced in the West, and especially those affecting the intestinal canal. Frostbites are seldom observed. Even typhoid is restrained within moderate limits, and so far has reached only a fraction of the 75,000 cases which appeared in the war of 1870-1871 in a small force, compared with our present army of millions. Even among physicians, typhoid has already demanded some victims. Altogether in the regular lists of losses published, 350 physicians, that is, about 3 per cent., are included, among them, 112 with slight and 40 with serious wounds; 1 is sick, 65 are dead and 124 missing, of whom the majority are prisoners. The latter, it is to be hoped, will gradually return to their mother country in the way of exchange. A few days ago eight French army surgeons and 85 members of the sanitary corps were discharged from the German prison, and as many of the medical division of our army will return to us from France.

ABUNDANCE OF SUPPLIES AND MONEY

In spite of the enormous numbers, no difficulty has so far been experienced with reference to bandages and medical supplies for the treatment of the wounded. Both in the matter of food and also in that of medicine, our land produces more than it needs. To be sure, the export of a number of medicaments has been forbidden, including antifebrin, aspirin, cocain, formaldehyd, phenol (carbolic acid), morphin, opium, phenacetin, codein, pyramidon, antipyrin, salipyrin, mercury and mercuric salts, bacterial serums and the like.

HELP FOR LYING-IN WOMEN

The imperial fund affords an extraordinary contribution to lying-in women for the period after delivery, provided their husbands are serving in the army or medical corps or similar service not of a commercial nature during the present war, and that these men are insured against sickness. The assistance consists in all those services which the imperial insurance law designates as *Wochenhilfe*, and includes what the Krankenkassen are legally obliged to furnish and also in general what they are able to undertake as a voluntary contribution through their fees. These services include the help of a midwife or a physician not only during labor, but also for any complaints due to pregnancy, and further a stipend for the puerperium and for nursing. The puerperal stipend is paid at the rate of a mark (24 cents) a day for eight weeks. The nursing money is received at the rate of 50 pfennig (12 cents) per day by the mothers, as long as they themselves nurse their infants, for a period of twelve weeks after the delivery. The Krankenkassen furnish these services and receive compensation for them from the imperial treasury. For the treatment during labor, 25 marks are paid for each case, and an amount up to 10 marks for illness during pregnancy. The insurance societies may choose to furnish treatment by a physician or midwife directly instead of providing a cash payment. This is on condition that the insurance society has a contract for this purpose with its physician and could not, for this reason, as well as on account of the necessity of using the imperial assistance generally in an even manner, make general rules. It is important that the help in case of labor shall also be assured in cases in which the husband, by entering the army, has made no use of his right for voluntary additional insurance. Moreover, the Krankenkassen must supply the same assistance in case of labor for women who have insured themselves and in whose case there is no question of the husband taking part in the war.

THE UNEMPLOYED

As far as the assistance to the unemployed is concerned, it must be stated that the number of these persons has been continually decreasing for some weeks. The entire number of members liable to insurance of the twenty-eight local general sickness insurance societies of Berlin increased in one week by 2,000, or 0.5 per cent. The 210 trade Krankenkassen showed an increase of 0.9 per cent.. Among the free companies, the number of unemployed has fallen 6.5 per cent. in one week.

TREATMENT OF THE WOUNDED

The results of the treatment of the wounded are, as previously, particularly favorable. Only tetanus and the gas phlegmons have been observed among wound infections with an apparently greater frequency in this war. The percentage of these complications is in general, however, small. So far as can be judged at present, the number of those who have become fit for service again is considerable. According to a statement by Czerny of Heidelberg, 37.5 per cent. of the wounded in his experience are already cured, and only 6.5 per cent. have remained unfit for duty.

Seventieth Birthday of Professor Fritsch

Professor Fritsch, formerly for many years director of the Bonn University clinic for gynecology, celebrated his seventieth birthday, December 5. He was first assistant of Professor Olshausen, joined the faculty of Halle in 1874 as privat-docent, in 1882 became regular professor and the successor of Spiegelberg at Breslau, and in 1883 director of the gynecologic clinic of Bonn. In 1911, he retired from his position on account of ill health, and removed to Hamburg, principally in order to be treated by his son-in-law, Professor Brauer. Of his text-books, "Das Lehrbuch über Frauenkrankheiten," "Das Lehrbuch der Geburtshilfe," "Die gerichtsärztliche Geburtshilfe," and "Pathologie und Therapie des Wochenbetts" are noteworthy.

Marriages

DELIVAN ALEXANDER MACGREGOR, M.D., Wheeling, W. Va., to Miss Ethel Marguerite Eastman of Iowa City, Ia., December 31.

WALTER WYNN BARNETT, M.D., Fort Wayne, Ind., to Miss Irma Bogash of Valparaiso, Ind., December 23.

JOHN WALTER MORRIS, M.D., to Miss Frances J. Moorman, both of Somerville, Tenn., December 29.

HENRY SHILLINGFORD MILES, M.D., to Miss Edith Alicia Zink, both of Bridgeport, Conn., January 2.

JOHN LUTHER SPANGLER, M.D., York, Pa., to Miss Mary E. Fink of Manchester Borough, Pa., December 25.

PHILIP MILLS JONES, M.D., to Miss Helen Louise Spalding, both of San Francisco, December 13.

CHARLES SHIVERS HERITAGE, M.D., to Miss Annie Whitney Knock, both of Glassboro, N. J., November 11.

Deaths

Dudley Peter Allen, M.D. Harvard Medical School, 1880; a Fellow of the American Medical Association and formerly president of the Ohio State Medical Association; president of the American Surgical Association in 1906-1907; professor of principles of surgery in the Medical Department of Medical Reserve University, Cleveland, for many years, and later emeritus professor of surgery; visiting surgeon to the Lakeside Hospital and consulting surgeon to the Charity and City hospitals, Cleveland; a director of the First National Bank and Trust Company, Cleveland, and a trustee of Oberlin College which conferred on him the honorary degrees of M.A. in 1883 and of LL.D. in 1908; died in a hotel in New York City, January 6, from pneumonia, aged 62.

Waldemar Edward Fischer, M.D. Marion-Sims College of Medicine, St. Louis, 1888; a Fellow of the American Medical Association; formerly assistant to the eye clinic in his Alma Mater; oculist to the Missouri Baptist Sanitarium, St. Louis; First Lieutenant Medical Reserve Corps, U. S. Army; a well-known ophthalmologist of St. Louis; died in that city, December 9, it is believed by his own hand, while mentally irresponsible.

David J. Loring, M.D. Rush Medical College, 1878; a Fellow of the American Medical Association; and secretary to the Porter County (Ind.) Medical Society; surgeon to the Loring Private Hospital, Valparaiso; local surgeon of the Pennsylvania, Grand Trunk and Nickel Plate systems; formerly surgeon in chief to St. Margaret's Hospital, Hammond; died at his home in Valparaiso, Ind., December 29, from ptomain poisoning, aged 66.

Henry B. A. Kugeler, M.D. University of California, San Francisco, 1890; a Fellow of the American Medical Association; instructor in operative surgery and chief of the surgical dispensary clinic in his Alma Mater; visiting surgeon to St. Joseph's Hospital, San Francisco; a well-known and highly respected surgeon of San Francisco; long a sufferer from kidney disease; died December 27, from carcinoma of the prostate gland, aged 44.

James B. Cox, M.D. College of Physicians and Surgeons, Keokuk, 1865; a pioneer practitioner of Benton County, Ia., and for nearly half a century a practitioner of Belle Plaine; and for thirty years local surgeon to the Northwestern System; died suddenly at his home in Belle Plaine, December 20, aged 72.

Zachariah Ford Lillard, M.D. Missouri Medical College, St. Louis, 1891; a member of the State Medical Association of Texas; local surgeon at Houston for the Southern Pacific System; and a member of the Houston Board of Health; died in the John Sealy Hospital, Galveston, Tex., December 27, aged 54.

Alton H. Garratt, M.D. Trinity Medical College, Toronto, 1888; demonstrator of clinical gynecology in the University of Toronto; one of the founders of the Toronto General and St. Michael's hospitals, Toronto; died at his home in that city, December 21, from heart disease, aged 49.

Elijah B. Bush, M.D. Atlanta (Ga.) Medical College, 1850; formerly a member of the general assembly and senate of

Georgia, and for several years physician in chief to the state penitentiary; died at his home in Colquitt, Ga., December 22, from nephritis, aged 54.

Charles L. Grube, M.D. Saginaw Valley Medical College, Saginaw, Mich., 1900; a physician and druggist of Saginaw, Mich.; once coroner of Saginaw County and for two terms city physician of Saginaw; died in the Pontiac State Hospital, December 21, aged 40.

John Harry Swaving, M.D. University of Pennsylvania, Philadelphia, 1889; formerly a Fellow of the American Medical Association; surgeon to the State Sanatorium, Hamburg; died at his home in Pottsville, Pa., December 30, from cerebral hemorrhage, aged 47.

Eber Leslie Washburn, M.D. University of Vermont, Burlington, 1896; a Fellow of the American Medical Association and a specialist on diseases of the eye, ear, nose and throat of East Berkshire, Vt.; was found dead in his barn, December 14, aged 50.

John H. Dupin (license, Kentucky, forty years practice, 1893) a veteran of the Mexican War and for many years a practitioner and dentist of Uniontown, Ky.; died at the home of his daughter in St. Louis, in September, from senile debility, aged 87.

Calvin Brewer Anderson, M.D. Dartmouth Medical School, Hanover, N. H., 1878; a veteran of the Civil War and for many years a practitioner of Vermont; died at the home of his daughter in San Antonio, Tex., August 30, from kidney disease, aged 78.

Robert C. Grigg, M.D. Rush Medical College, 1871; a veteran of the Civil War; for thirty-two years a practitioner of Murray, Ia., and later a resident of Des Moines and Sioux City; died at his home in the latter city, December 12, aged 76.

William Marcellus Eddy, M.D. Cleveland University of Medicine and Surgery, 1865; later instructor in anatomy in his Alma Mater; a pioneer practitioner of Marengo, Ia.; died at his home in that place, December 27, aged 76.

Henry Dusenbury, M.D. College of Physicians and Surgeons in the City of New York, 1866; for nearly half a century a practitioner of Williamsburg, Brooklyn; died at his home, December 30, from senile debility, aged 80.

John T. Johnson, M.D. University of Pennsylvania, Philadelphia, 1861; a Confederate veteran and for nearly half a century a practitioner of Hickory, N. C.; died at his home in that place, December 24, from pneumonia, aged 78.

James Vercoe, M.D. Michigan College of Medicine, Detroit, 1881; for thirty years a physician and druggist of Skagit County, Wash.; died on his ranch on the Olympia Marsh, near Maiben Station, Wash., December 19.

George Loring Pierce, M.D. Medical School of Maine, Brunswick, 1861; Jefferson Medical College, 1879; for many years a practitioner of New York City; died at his old home in Kittery Depot, Me., December 22, aged 77.

Junius Terry, M.D. Missouri Medical College, St. Louis, 1861; for thirty years a resident of Chicago; died at his home in that city, December 28, aged 73.

John Edgar Tamlyn, M.D. University of Toronto, Ont., 1864; for forty-eight years a practitioner of Wingham, Ont.; died at his home December 18, aged 81.

Thomas J. Rude (license, Kansas, 1903), formerly principal of the Burton (Kan.) schools; died at his home in Cambridge, Kan., December 13, aged 58.

Sherwood E. Seeley (license, Illinois, years of practice, 1877), for half a century a resident of Fulton, Ill.; died at his home, December 18, aged 82.

George Nichols, M.D. Hahnemann Medical College, Philadelphia, 1861; died at his home in Brooklyn, December 10, from heart disease, aged 85.

Robert C. Carroll, M.D. Western University, London, Ont., 1909; of Calgary, Alta.; died at North Dunwich, Ont., about November 23, aged 31.

Walter W. Atkins, M.D. College of Physicians and Surgeons, Keokuk, Ia., 1887; died at his home in Milton, Ia., December 14, aged 61.

Morton Grant Sturdevant, M.D. University of Louisville, Ky., 1896; died recently at his home in Salem, Ind., aged 43.

Frank A. Barber, M.D. Bennett Medical College, Chicago, 1878; died at his home in Chicago, December 27, aged 60.

Julius L. Friedler, M.D. Bellevue Hospital Medical College, 1890; died at his home in New York City, December 13, aged 59.

The Propaganda for Reform

In This Department Appear Reports of the Council on Pharmacy and Chemistry and of the Association Laboratory, Together with Other Matter Tending to Aid Intelligent Prescribing and to Oppose Medical Fraud on the Public and on the Profession

ABOLISHING SECRECY AND MYSTERY IN PATENT MEDICINES

New York City Makes a Move to Protect the Public Against the Nostrum Evil

[For some time past, Dr. S. S. Goldwater, Health Commissioner of New York City, has been making an effort to protect the public against the dangers and frauds in "patent medicines." Dr. Goldwater's work was finally crystalized into a revision of the sanitary code that was adopted by the New York Board of Health at its regular meeting Dec. 31, 1914. That part of the revised code regulating the sale of proprietary medicines requires that all "patent medicines" shall bear on the labels the names of their ingredients or, as an alternative, the names of such ingredients shall be registered with the Department of Health. This regulation is not to go into effect before Dec. 31, 1915, thus allowing druggists a year to dispose of stock already on hand. Needless to say, the "patent medicine" interests are up in arms against this attempt to destroy their most valuable assets—secrecy and mystery.

The New York *Tribune* is printing a series of articles on advertising, written from the standpoint of the public rather than the advertiser. The series is written by Samuel Hopkins Adams, whose name is a sufficient guarantee that the subject is being dealt with, not only from the view of the best interests of the public, but also in a way that admits of no equivocation. The first article of the series appeared in the *Tribune* of January 4. In the *Tribune* January 8, Mr. Adams describes the protest made at the public hearing held in the City Hall on January 7 by the "patent medicine" interests against the Board of Health's new labeling regulation. We give below in full Mr. Adams' article. Our readers will recognize some familiar names in those who appeared before the Board of Health in behalf of "patent medicines." The name of Dr. William C. Anderson will call to the memory of our readers The Journal's exposés of the "American Druggists Syndicate," an organization that brazenly announced that it had appropriated physicians' prescriptions and was dispensing them in ready-made packages. Dr. Anderson was chairman of the syndicate's "formula committee" which was alleged to pass on the value of "thousands of prescriptions written by the most successful physicians in every state in the Union" and to "select the premium prescription and offer it to the public in a ready-made package."

Henry R. Strong, who went from St. Louis to New York to join in the protests is the publisher of the *Medical Brief* and the *National Druggist*. The *Medical Brief* is, as most physicians know, a nostrum-exploiting sheet, whose continued existence is due to the easy tolerance of the medical profession. The *National Druggist* has for years apparently acted as the mouthpiece for the "patent medicine" interests. Letters and pamphlets have been circulated broadcast, blackguarding the medical profession in general and the American Medical Association in particular. "The Menace of the Dispensing Doctor," "A Conspiracy to Establish a Physicians' Trust," "The Machinations of the American Medical Association" and "Confiscatory Legislation"—these are but a few of the tirades from the *National Druggist* against the medical profession. It was the *National Drug-*

gist also that protested against any amendment to the Food and Drugs Act, that would prohibit false and fraudulent claims for curative effects of "patent medicines." Broadly, it may be said that the *Medical Brief* and the *National Druggist* stand for everything that reputable physicians oppose. It is not surprising, therefore, that Mr. Strong was on hand to champion the interests of his clientele at the public hearing for the New York Board of Health.

It was, of course, entirely fitting that A. V. Payne, exploiter of as cruel a fraud as there is on the market—Pulmonol, an alleged "consumption cure"—should join hands with Mr. Strong, Dr. Anderson, Mr. Thompson, the general counsel for the "patent medicine" combine, and Albert Plaut, president of Lehn and Fink. But we will give Mr. Adams' report in full, as it appeared in the *Tribune*, and our readers can draw their own conclusions:]

CONSPIRACY, BOGIE CRY OF MEDICINE MEN

INTERESTS BACK OF TRAFFIC IN PATENT "CURES" PROTEST AT CITY HALL

By Samuel Hopkins Adams

All the familiar patent medicine bogies were trotted out into the light of day at the Board of Health hearing held in the City Hall yesterday afternoon and made to rattle their poor, ricketty bones in protest against the board's honest labelling regulation. This order requires that the ingredients of every patent medicine sold in this city shall either be stated on the label or filed with the board. Secrecy being the life of trade with the nostrums, the representatives of various allied industries, retail and wholesale druggists, patent medicine manufacturers, handlers of crooked advertising, proprietors of not-too-particular journals, lawyers and quacks flocked to the place in such numbers that the big room couldn't hold all of them.

They shouted approval when their spokesman denounced the wicked "medical trust" which is trying to keep the beneficent dopes and booze medicines from doing so much good in secret; they wildly cheered the quack doctor who seized the occasion to give a little advertising to his own fake consumption cure; and they hissed, booed and hooted the presiding officer, Dr. Goldwater, when he attempted to stem the tide of general denunciation and get down to specific data.

QUACKS HAVE A DAY

It was distinctly and exclusively their day. Only opposition to the measure was in order, the only restriction being that legal points were not permitted. The forces of secrecy in medicine were marshalled by Dr. William C. Anderson, who, to do him justice, did his best against heavy odds to keep his unruly followers in order. He opened the meeting for the opponents of the bill by stating his imperishable conviction that there were already all the patent medicine laws on the books that the public could stand, to which sentiment the embattled druggists on the benches responded with howls of approbation. He then introduced Albert Plaut, of Lehn & Fink, a wholesale drug firm.

Mr. Plaut was a perfect Cassandra of calamity. If the Board of Health regulation was enforced, he declared, eight out of the twelve great drug houses in the city would have to move to Jersey or elsewhere. Dr. Goldwater, whose disposition to get at the bottom of matters proved embarassing if not actually painful to various of the speakers in the course of the proceedings, asked why the other four should stay. After some hesitancy Mr. Plaut decided that it would be because their trade was largely local. There was no other form of business, he declared, more open and above-board than the business of selling drugs.

"If that is the case," queried the commissioner, "why do you insist on secrecy?"

To which the speaker hadn't found a reply at time of going to press.

HOOT AT GOLDWATER

Dr. J. H. Rehfuss, of the New York Pharmaceutical Association, roused the interest of the board to such an extent that they asked him several questions pertinent to the line of his remarks. This was hotly resented by the embattled druggists, who yelled, hooted, hissed and warned Dr. Goldwater that he was in the United States, where he "couldn't put any Russian business over."

When the disorder was quieted, Mr. Henry R. Strong, representing the pharmaceutical press, took the floor to enunciate the noble principle, with much gesticulatory emphasis, that he was of Anglo-Saxon blood and nobody could take away from him the right to drink what he wished. Nobody being found who wanted to, he made a somewhat mixed impression upon his hearers by telling them that he knew the drug trade well, and that he didn't doubt but what a large proportion of those present were unprincipled. To conclude, he produced the old bogie of "medical trust conspiracy." One interesting point which he neglected to mention was that that portion of the pharmaceutical press which he represents lives largely on fraudulent medical advertisements which a high class drug medium, like the Druggists' Circular, for example, would not permit in its columns.

The singular spectacle of an official intrusted with the safeguarding of the public health acting directly against the interests of the public health was presented when Alderman Jacob Weil took the floor to oppose the bill. In private life Mr. Weil is a jobber in the drug trade. In public life he is chairman of the health committee of the Board of Aldermen. His proposition, which had at least the virtue of ingenuousness, was that the whole matter be referred to his committee. Presumably on the ground that he wasn't sure whether Mr. Weil would act upon it as an alderman or as a secrecy-defending druggist, Dr. Goldwater failed to seize this opportunity of ending the trouble. Unfortunately the aldermanic advocate fell into a snare when he declared that all good and high-minded druggists, the kind whom he saw before him in such impressive numbers, were against the evil patent medicines and would support an ordinance, for example, forbidding the sale of consumption cures.

"MEDICAL TRUST" NEW BOGIE

Straightway up jumped Dr. A. V. Payne, of Pulmonol illfame. He sailed into the "medical trust"; he denounced the American Medical Association; he fulminated against conspiracy, and he was fairly launched upon a glowing testimonial to his own fake consumption cure when the chair called him to order. And that great crowd of good and high minded druggists (Alderman Weil's guarantee), strong against the evil patent medicines, cheered the exponent of the wickedest and meanest of all forms of charlatanry to the echo. Mr. Weil was not called in rebuttal. After Samuel C. Henry had spoken for the out-of-town drug trade a gentleman named Weinert appeared as representing the poor. The bill, he said, would be very bad for the poor. If secrecy were abolished on the patent medicine bottle the submerged tenth of our populace, if Mr. Weinert is to be believed, would wither away and perish, presumably of chagrin at finding out what sort of trash they had been paying good money for all these years—though the speaker didn't say so. Mild but insistent questioning by Dr. Goldwater elicited the fact from the reluctant lips of Weinert that he was an advertising solicitor for two East Side papers which subsist largely on patent medicine advertising. After this Mr. Weinert seemed to lose interest in himself.

Another coy speaker was Henry B. Thompson. Bland and oratorical is Mr. Thompson, as befits the general counsel for the Proprietary Association of America, better known as the patent medicine combination; and quite outspoken to the extent of explaining his official status. The coyness developed when he was asked for details.

"What is the Proprietary Association?" asked Dr. Goldwater.

"An organization of manufacturers of proprietary remedies," was the reply.

"Will you give a list of membership?"

"I will not," said Mr. Thompson shrinkingly, but with determination.

"Just one or two?" persuaded the commissioner.

Mr. Thompson, after a struggle with his natural reticence, managed to emit the style and title of a comparatively innocent liver pill.

"Another?" suggested the presiding official.

Further painful effort produced the name of a laxative syrup.

"More?" encouraged Dr. Goldwater.

At this point aphasia supervened. In vain did Mr. Thompson call upon his memory. All the great, blatant quackeries which club together to employ him had slipped from his mind, though their advertisements afflict the eye daily from coast to coast. He shyly murmured something about "a good many others," and launched into forensic oratory to prove that the board had no power to limit personal liberty, confiscate property rights, interfere with business, and so on.

Then Peter Diamond, a type of the oldtime high-class prescription druggist, made a temperate speech, objecting to the regulation as infringing upon the practice of pharmacy. Professor Raubenheimer dipped into patent medicine history, and the hearing closed.

BELL-ANS (PA-PAY-ANS, BELL)

Another "Patent Medicine" Foisted on the Public Through the Medical Profession

With such nostrums as Antikamnia and Resinol fresh in mind as flagrant examples of "patent medicines" introduced to the public through the medical profession, what follows regarding Bell-ans, or, as it is better remembered by physicians, Pa-pay-ans (Bell), will take on an added interest. Briefly, Bell-ans is the new name of a tablet that, according to chemists' reports, is essentially charcoal, baking soda and ginger, flavored with oil of wintergreen. Its selling point, in the past at least, has been the alleged presence of papain. This drug, Bell & Co. allege, is present in their tablets and they claim is "the digestive principle obtained by our own exclusive process from the fruit of *Carica papaya*." As long ago as 1909, the Council on Pharmacy and Chemistry attempted to find papain present in what was then called Pap-pay-ans (Bell) and to determine the digestive power of the tablets but with negative results. The efforts of other chemists were equally unavailing.

In January, 1914, Bell and Company changed the name of the product "Pa-pay-ans (Bell)" to "Bell-ans." As THE JOURNAL remarked soon after, it seemed probable that, as the name of a nostrum of this kind is the manufacturer's most valuable asset, the name was hardly changed, as was alleged, for purely euphonious reasons. It seemed more likely that as analyses had indicated there was not, and probably never had been, any appreciable amount of papain in the product, the change of name might be due to the fear that some day the misleading name might bring the preparation in conflict with the federal Food and Drugs Act.

For years physicians have realized that the methods of exploitation of Pa-pay-ans (Bell) have been such as to make the medical profession a vast free advertising agency for the nostrum. So far as we know Pa-pay-ans (Bell) has never been advertised in lay journals—newspapers, etc. Certain medical journals, however, have, for a long time, carried the advertisements of Pa-pay-ans (Bell)—and later of Bell-ans—while Bell & Co. has been lavish in its distribution of free samples, blotters and other advertising paraphernalia direct to the medical profession.

Now it seems, Bell and Company are going direct to the public by means of vest-pocket samples and letters. The letter, a miniature facsimile of which we reproduce, is one addressed to laymen and accompanies a vest-pocket box of the nostrum.

Here are some of the things that Bell and Company claim Bell-ans will do:

"It removes flatulence, vertigo, weakness and other symptoms of indigestion quickly and pleasantly."

"It relieves vomiting in pregnancy, alcoholism, seasickness and cholera morbus. . . ."

"To promote appetite, digestion, and the elimination of toxic and waste material, prescribe two Bell-ans. . . ."

". . . prevent eruptions, nausea, vertigo, pain, etc. . . ."

". . . remove distension, pain, weakness, depression, etc. . . ."

"There is no derangement of the digestive organs upon which the proper dose of Bell-ans (Pa-pay-ans, Bell) will not act quickly, pleasantly and favorably . . ."

CABLE ADDRESS "PAPAYANS" TELEPHONE 238 HEDMONT

BELL & COMPANY
INCORPORATED
MANUFACTURING CHEMISTS

EUROPEAN AGENCY
THOS CHRISTY & CO
OF OLD CHEN LANE
UPPER THAMES ST
LONDON ENGLAND

PA-PAYANS BELL
FOR THE TREATMENT OF
INDIGESTION
NOW KNOWN AS
BELL-ANS
ADOPTED JAN 1914

AGENCY FOR
ASIA & AFRICA
BULLER MACLEAN & CO
CALCUTTA INDIA

LABORATORY & OFFICES
ORANGEBURG, NEW YORK, U.S.A.

Dear Sirs-

Please accept with our compliments and good wishes, this pocket box of our product BELL-ANS.

We have been making BELL-ANS for nearly twenty years and over one hundred thousand physicians are now prescribing it. It is perfectly harmless, as any druggist will tell you, and it certainly relieves Indigestion and sweetens the breath.

Kindly oblige us by giving BELL-ANS a trial and, if you like, write us of the results.

With kindest regards, we are,

Sincerely yours,

Bell & Co. (Inc.)

Dec. 24th, 1914.

Miniature facsimile of a letter received by a layman. It was accompanied by a small box of Bell-ans. Two points are worth noting: ". . . one hundred thousand physicians are now prescribing it"; "any druggist will tell you" that it is perfectly harmless!

There is no physician living who really believes such claims as these! Yet on the medical profession rests the responsibility for the exploitation of this nostrum. Those medical journals which accept advertisements for things of this kind are not so much to blame as those physicians who unprotestingly tolerate the journals that do so. Privately owned medical journals are published, usually, as a commercial proposition; they reflect, to a greater or lesser extent, the attitude of their readers, subscribers and contributors. There are at least three medical journals which carry the advertisements of Bell-ans. They are the *New York Medical Journal*, the *International Journal of Surgery* and the *Massachusetts Medical Journal*.

Bell-ans (Pa-pay-ans, Bell) possesses the virtues—and they are few—and the limitations—and these are many—inherent to a mixture of bicarbonate of soda, ginger and charcoal. Any druggist could put up just as good a remedy, and any physician could write a prescription for a better one in those cases in which he might think it indicated. The whole secret of the commercial success of Bell-ans lies in the mystery of its composition and the fraudulence of the claims that have been made for it. The same tablets put out under a non-proprietary name, as an open formula and with claims that were reasonable and true, would have had practically no sale. The commercial success of Bell-ans is a monument whose foundation rests equally on the unscrupulousness of the manufacturer and on the gullibility of a learned profession.

Correspondence

"Hospitalism" and Infant Hospitals

To the Editor:—I regret very deeply that Dr. Henry Dwight Chapin did not make two articles out of the one entitled, "Are Institutions for Infants Necessary?" which appeared in THE JOURNAL of January 2. One article might then have been entitled, "Are Infant Asylums Necessary?" and his conclusion would have been "No," in agreement with practically all thought on this line of social work.

His second article might have had the title, "How Can Mortality in Infant Hospitals be Reduced?" or "Successful Methods Used in a Certain Infant Hospital, as Shown by Its Low Mortality Record." An abstract of the second article might then have read as follows: "Hospital marasmus the result of bad hygiene and ward infections. Such infections recall mortality of old time maternity hospitals. No excuse for either in this century. Methods which allow such infections have survived from 200 years ago. Modern methods in hygiene, individualization, and aseptic nursing prevent high mortality. Skilled care by trained hospital attendants desirable. Infant hospitals necessary to save infant life, both in acute and chronic ailments. Long residence will not expose infants to cross infection and bad hygiene, if short residence does not. Modern methods in a certain infant hospital are based on principle that infections are carried, not air-borne. Hygienic methods adequate to baby life worked out in detail. Personality and individuality of babies respected, studied and acted on. Result is that mortality is less than that of community in which hospital is located in spite of fact that only sick babies are admitted. Hospitalism not allowed to develop."

Naturally I cannot expect successfully to force my thoughts on another, but am only imagining what Dr. Chapin might have written to please me. Without hint of personal criticism I may be allowed to regret that he has so unfortunately confused the work of infant hospitals and asylums, and has seemed to pass up the problems of infant hospitals as hopeless. To turn all chronic cases of infant sickness over to the substandard care of foster mothers would be to do away with invaluable and efficient hospital methods. We have the knowledge and ability to prevent "hospitalism" in infant hospitals. This knowledge should be applied, as I know from personal experience that it can be.

A. W. GRAY, M.D., Milwaukee.

[The above letter was referred to Dr. Henry D. Chapin who replied:]

To the Editor:—I regret that my recent article "Are Institutions for Infants Necessary?" does not seem wholly to have pleased your correspondent. However, I think he has failed to grasp the meaning of my suggestions. I do not believe we differ very much. My contention is that many sick infants may be successfully treated at home if efficient nursing can be obtained. The statistics I produced from the Henry Street Settlement, New York, prove this point, although the work was carried out in the most densely populated tenement house district in the world. I do not propose to hand over sick infants to foster mothers as the doctor seems to imagine, and I tried to make very clear the dstinction between infant asylums and hospitals. The systematized and regulated "boarding out" I advise only as a substitute for the asylums which should all be abolished.

I tried to emphasize the fact that strict aseptic nursing and small units are essential to success. These I have employed, but a very large experience in this work, under favorable conditions, has convinced me that a short stay in the hospital is best for the infant, who should be discharged as soon as the acute symptoms have subsided. The infant seems to lose immunity and resistance after too long a stay in a hospital, even with good nursing and care. As an example, unless all visitors are absolutely barred, influenza and other infections are exceedingly difficult to constantly keep out. The nurses and attendants themselves may at times be the carriers of these infections. My critic seems to have been fortunate in always securing the perfection of nursing so necessary for infants—but, even with this, the baby is usually better at home during the convalescent stage. "The personality and individuality of babies" can here be best conserved. Some infants' hospitals depend largely for their nursing upon women who are under short training to act as nursery maids.

I am familiar with many of the infants' hospitals of the world and willingly concede that under the conditions mentioned in my article they can do good work, but there is no great need for their multiplication. Some of the work that devolves upon them can, with a little extra care, be accomplished as well at home and often under safer and more normal conditions for the infant. The personality of the baby calls for individual and loving care if the best results are to be obtained.

HENRY DWIGHT CHAPIN, M.D., New York.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

OLIVE AND COTTONSEED OILS

To the Editor:—1. What is the comparative value of olive and cottonseed oils?

2. Are our olive oils, produced here or imported, adulterated with cottonseed oil?

M. R. MORDEN, M.D., Adrian, Mich.

ANSWER.—1. For ordinary pharmaceutical uses, there seems to be no reason why one cannot be substituted for the other. Their dietetic value is also essentially the same.

2. While the exportation of cottonseed oil for the purpose of reimporting it as olive oil or using it to adulterate that oil was formerly quite prevalent, the practice, we understand, has practically ceased.

REQUEST FOR TITLES OF ORIGINAL CONTRIBUTIONS TO THE MEDICAL SCIENCES

To the Editor:—I am writing a paper on the *original* contributions of America to medical sciences.

By *original* contribution is meant something new that has not been done before by somebody else.

I respectfully solicit the members of the profession to send me the titles of their original contributions, and also the titles of the original contributions of other members of the profession, past or present.

EDMOND SOUCHON, 2403 St. Charles Avenue, New Orleans.
Jan. 7, 1915.

REMOVAL OF RUST FROM INSTRUMENTS

To the Editor:—Your correspondent (THE JOURNAL, Jan. 2, 1915, p. 72) should try a solution of tin chlorid, preferably hot, into which the rusted instruments are to be laid and afterward rinsed in clear water. The abrasives remove the polish.

EDMUND D. SPEARS, M.D., Boston.

Armies of Slaughter and the Army of Prevention.—We shudder at the needless slaughter of the brave young fellows—allies and foes alike—but think of the slaughter which goes on in our homes, just as cruel as, often more cruel than, that of the battle-field! Tuberculosis alone will kill ten times as many this year in Great Britain as will die abroad for their country. Comparing the death-rate in England to-day with that of fifty years ago we may say that, as a result of the work of the other army, more will be saved from death by enteric fever in 1914 than will be killed this year in the war. Eberth's *Bacillus typhosus* will kill in 1914 in the United States more than will German shrapnel and bullets in France and Russia. Moving in silence, the great army of sanitation, with a general staff and leaders of all lands and languages, claims allegiance only to Humanity. In war it has not often fought winning campaigns, but the new knowledge is full of such promise that even the vanquished may be victors.—Sir W. Osler in *British Medical Journal.*

Medical Education and State Boards of Registration

COMING EXAMINATIONS

IOWA: Des Moines, Jan. 19-21, 1915. Sec., Dr. Guilford H. Sumner, Capitol Bldg., Des Moines.

KANSAS: Topeka, Feb. 9-11, 1915. Sec., Dr. H. A. Dykes, Lebanon.

NEW YORK: Albany, Buffalo, New York, Syracuse, Jan. 26-29, 1915. Mr. H. H. Horner, Chief, Examination Division, State Education Bldg., Albany.

Massachusetts September Report

Dr. Walter P. Bowers, secretary of the Massachusetts State Board of Registration in Medicine, reports the oral, practical and written examination held at Boston, Sept. 8-10, 1914. The total number of subjects examined in was 13; total number of questions asked, 74; percentage required to pass, 75. The total number of candidates examined was 51, of whom 20 passed, including one osteopath, and 31 failed, including 7 osteopaths and 12 non-graduates. The following colleges were represented:

PASSED		
College	Year Grad.	Per Cent.
Yale Medical School	(1905)	81.4
Indiana College of Medicine and Midwifery	(1888)	77.7*
Medical School of Maine	(1913) 75.7, 80.6; (1914)	75.6
Coll. of Phys. and Surgs., Baltimore	(1911) 75; (1913) 75.2; (1914) 75.4.	
Johns Hopkins University	(1911)	82.5
Boston University	(1914)	80.7
Harvard University	(1914)	77.2
Tufts College Medical School	(1905) 77; (1913) 80.6; (1914) 75,	75.2
Dartmouth Medical School	(1914)	79.5
University and Bellevue Hospital Medical College	(1913)	75
Medico-Chirurgical College of Philadelphia	(1914)	75
University of Vermont	(1914)	77.5

* Graduation not verified.

FAILED		
Bennett Medical College	(1912)	64.2
University of Louisville	(1912) 65.7,	71.3
College of Physicians and Surgeons, Boston	(1907) 58.1; (1908) 65.7; (1913) 67.7, 71; (1914) 69.6.	
Tufts College Medical College	(1913)	73.7
Bellevue Hospital Medical College	(1887)	32.2
University of West Tennessee	(1913)	68.8
Syrian Protestant College	(1890)	43.6
Non-graduates, 25.6, 48.1, 60.5, 61.2, 61.7, 67, 70.1, 70.6, 71.2, 71.5, 71.8, 72.1.		

The following questions were asked:

DIAGNOSIS AND THERAPEUTICS

1. Mention three of the most frequent complications which may arise during an attack of lobar pneumonia. Give treatment for one of them. 2. What complications may arise in whooping-cough? What means should be adopted in the treatment of the disease to prevent them? 3. Define and give etiology of Ludwig's angina (cellulitis of the neck). 4. Give the pathognomonic symptom or symptoms, if such there be, of malaria. Also your treatment for that disease. 5. Write a page on the causes, symptoms and treatment of exophthalmic goiter. 6. Give description, causes and treatment of a case of urticaria. 7. Patient, a man 44 years of age, began a year ago with frequent attacks of vertigo, persistent and increasing headache, difficulty of vision and speech, convulsions without loss of consciousness, and at times nausea and vomiting. What is your diagnosis? 8. Outline a course of treatment for a case of gout. 9. Give causes, symptoms and treatment of herpes zoster. 10. What indications or symptoms would call for the administration of ergot? If your practice does not include the use of drugs, what methods would you employ in place of the drug?

ANATOMY AND HISTOLOGY

1. What anatomic structures are involved in the problem of fallen arches? 2. Describe the semicircular canals. 3. Give an outline of the regional anatomy of the neck. 4. Give a description of heart muscle. 5. Describe the hip joint. 6. What bones are involved in so-called Colles' fracture? 7. Describe the pancreas. 8. Give the distribution and arrangement of the blood-vessels of the kidney. 9. Describe the patella, giving its relations and attachments. 10. What are sesamoid bones and where found?

PEDIATRICS AND TOXICOLOGY

1. What standards should be required of milk producers? 2. Give etiology and treatment of cholera infantum. 3. What would indicate a pyloric stenosis in early life? 4. Give your treatment for chorea. 5. What are the dangers incident to removal of tonsils and adenoids? 6. What are the different forms of congenital herniae; what should be done in each case? 7. What is the cause of hydrocephalus? What treatment would you recommend? 8. Describe a case of toadstool poisoning and give treatment. 9. Differentiate strychnia and belladonna poisoning. 10. Describe clinically and pathologically chronic lead poisoning.

OBSTETRICS AND GYNECOLOGY

1. Why should the blood-pressure be taken during pregnancy? 2. How should a pregnant woman be advised concerning the care of her digestive organs during pregnancy? 3. How would you diagnose a twin pregnancy at the eighth month? 4. Can you always make a differential diagnosis between uterine fibroma and pregnancy? If so, how? 5. If a hand is found presenting during labor, what should be done? 6. What would lead you to suspect a dead fetus in utero at the eighth month? What questions would you ask the parents, and what advice would you give? 7. What is the explanation of pus tubes? Assuming that the patient may not be operated on, what will probably be the future history of such a case? 8. What is the law relating to the care of the eye of a new-born child? 9. Give the etiology and treatment of icterus neonatorum. 10. How do you treat caput succedaneum?

SURGERY

1. A woman 60 years of age, on rising in the morning, finds that her urine is distinctly bloody. She has no pain. What investigations should be made? 2. A patient has a continued fever lasting two weeks, ranging from 99 in the morning to 101.5 at night. She has two to four loose stools daily. The tongue is coated. Her abdomen is slightly tender to pressure to the left of the bladder region, and below the margin of the ribs 1 inch to the right of the right mammary line there is another tender area with slight resistance. Two years ago she had her breast removed for a so-called fibroid tumor. She has a negative Widal. She has a white count of 15,000. What would you do? 3. What are the indications for splenectomy? 4. What would you do for osteomyelitis of the tibia? 5. What is meant by artificial pneumothorax? 6. Discuss the surgical problem of abscess of the lung. 7. Describe briefly a case of abdominal fat necrosis, and state how it should be treated. 8. Give the etiology of cholelithiasis. 9. Under what circumstances may anastomosis of blood-vessels be employed? 10. A patient has round cell sarcoma of the glands of the neck. What may be done, and what is the probable history following treatment?

PATHOLOGY AND BACTERIOLOGY

1. Explain the phenomena of active and passive hyperemia. 2. A patient has an acute septicemia. What changes would be found in parenchymatous organs? 3. A patient dies of pyemia. Describe the kidney in such a case. 4. A person dies of abscess of the liver. Explain what may have caused this condition. 5. What would cause thrombosis of the mesenteric vessels? 6. Give the pathology of the different common forms of cystitis. 7. Give the pathology of elephantiasis. 8. Describe the blood in a case of myelogenous leukemia. 9. Give the pathology of malaria. 10. Describe the hookworm.

PHYSIOLOGY AND HYGIENE

1. What is the function and appearance of lymph? 2. What dietary conditions influence favorably or unfavorably the development of the teeth? 3. Describe and give the functions of the cellular elements of the blood, excepting the red blood-cells. 4. How and why do changes of temperature influence the functions of the kidneys? 5. What insects are dangerous to health? How should they be dealt with? 6. What changes result in muscle tissue following a diminished blood-supply? 7. What happens if the thyroid gland is removed? 8. What part of the brain is affected when a patient has aphasia? 9. How is acidity of the stomach maintained? 10. Describe the method of counting blood-cells.

Colorado October Report

Dr. David A. Strickler, secretary of the Colorado State Board of Medical Examiners, reports the oral and written examination held at Denver, Oct. 6, 1914. The total number of subjects examined in was 8; total number of questions asked, 80; percentage required to pass, 75. The total number of candidates examined was 4, including 1 osteopath, all of whom passed. Sixteen candidates were licensed through reciprocity. The following colleges were represented:

PASSED		
College	Year Grad.	Per Cent.
University of Colorado	(1914)	88.6
George Washington University	(1905)	80.6
Bennett Medical College	(1913)	75.6

LICENSED THROUGH RECIPROCITY		
College	Year Grad.	Reciprocity with
Hahnemann Med. Coll. and Hosp., Chicago	(1902)	Iowa
Northwestern University	(1913)	Illinois
Rush Medical College	(1886)	Iowa
Baltimore Medical College	(1902)	Maryland
College of Physicians and Surgeons, Baltimore	(1882)	Mississippi
Central Med. Coll. of St. Joseph	(1905)	Missouri
Homeopathic Med. Coll. of Missouri	(1899)	Missouri
Kansas City Medical College	(1904)	Kansas
Medical-Chirurgical College of Philadelphia	(1904)	Penna.
Missouri Medical College	(1898)	Missouri
St. Louis College of Phys. and Surgs.	(1906)	Illinois
Univ. Med. College, Kansas City	(1901) Missouri; (1905)	Kansas
Woman's Med. College of the N. Y. Infirmary for Women and Children	(1871)	New York
Vanderbilt University	(1900)	Tennessee
University of Texas	(1898)	Texas

Miscellany

The Rural School and Hookworm Disease

The connection between the rural school and hookworm disease is a close one. Dr. John A. Ferrell, assistant director of the International Health Commission, Washington, in a recent bulletin of the United States Bureau of Education (1914, No. 20) remarks that it has been found that the rural schools are the greatest mediums for the spread of the infection and the most important protective agencies against it. Records show an average infection among rural children of school age running as high as from 70 to 90 per cent. in whole counties, the schools being apparently the distributing centers for the disease. In a number of states, the state departments of health and education have cooperated to fight the disease. For the schools of Virginia a "health catechism" has been prepared in which the germ theory of disease, general sanitation, hookworm, tuberculosis and typhoid are taken up. The North Carolina State Department of Education has published a number of bulletins on health for the use of schools including one on "Ground-Itch or Hookworm Disease and Soil Pollution." Alabama and Kentucky have issued special bulletins on health subjects, including hookworm, for school use. In 1910-1911 all county teachers' institutes in Kentucky had lectures by health officers, and in 1913 lectures were given in all the Kentucky summer institutes by an expert furnished by the State Board of Health. In Arkansas the State Department of Public Instruction has cooperated closely with the work of the Rockefeller Sanitary Commission and the State Board of Health. One of the most successful ways of emphasizing the value of special instruction about hookworm disease is to include the subject in the state and county examinations for teachers' licenses. This is done in North Carolina.

Dr. Ferrell remarks that one particularly effective method of the control of hookworm disease by state departments of education has not been fully utilized. Wherever regulation of schoolhouse grounds has been centralized in the hands of the state authorities, sanitary disposal of filth on school premises may be insisted on. Virginia and North Carolina have taken advantage of this opportunity. No schoolhouse in these states will be accepted unless it fulfils state requirements as to sanitation. With a state system of medical inspection and with state authorities empowered to condemn the water-supply, hygienic features of the schoolroom, privies, etc., it would be possible to do much toward the elimination of hookworm and other preventable diseases. Emphasis is laid on the importance of making the school itself a model of sanitation.

It is remarked that the individual teachers have, in most cases, been of great assistance in the hookworm campaign not only in disseminating information on the subject but also in influencing children to submit to examinations. The teachers have usually taken the initiative in being examined and have let the fact be known. The children and, in many cases, the other members of the children's families, have followed the example thus set. Literature on hygiene and sanitation has been distributed from the state department of health and education through the medium of the teachers. Health topics have also been made the subject of essays and of public school debates.

The Syphilis Index

Five years ago B. P. Sormani of Amsterdam pointed out a number of sources of possible error in interpreting the findings with the Wassermann test (Sormani, B. P.: Ned. Tijdschr. v. Geneesk., 1901, ii, 1338; Arch. f. Dermat. u. Syph., 1909, xcviii, 73; Ztschr. f. Immunitätsforsch. u. exper. Therap., 1911, xi, 243; Ned. Tijdschr. v. Geneesk., 1913, i, 1700; Hammarcher, J. F. M.: Ned. Tijdschr. v. Geneesk., 1912, ii, 1203). He emphasized that a correct oversight of the actual condition could be obtained only when the test was applied both qualitatively and quantitatively, the findings then representing the actual condition of the syphilis at the time—a true index. Theoretically, during the first year this index figure should grow constantly larger for a certain length of time and then decline, the slant of the downward slope influenced by the effect of treatment. This theoretical curve was found to prevail with mathematical exactness in his study of 800 serums tested for the syphilis index, and other syphilologists in Holland have confirmed this importance of quantitative findings with the Wassermann test, and declare that the test as a guide to treatment is not to be relied on otherwise. With the ordinary technic the extract itself or the patient's serum or the combination of both may be capable of binding the complement and thus affecting the response to the test.

The specific hemolysis requires a definite amount of complement, but the complement available may vary with the concentration of the blood emulsion and with the complement content of the guinea-pig serum. These sources of error are obviated by using always fresh guinea-pig serum and by titrating beforehand the strength of the complement not only in relation to the hemolytic amboceptor but also to all the other factors involved, namely, the extract and the sheep blood. This titration is done with four sets of five test-tubes, one set with normal serum, one with the serum being examined, one with known syphilitic serum and one control set without serum. The index figure is that representing the smallest amount of extract required for complete hemolysis. By repeated serologic control in this way during the first year it seems possible to secure accurate oversight of the course of the syphilis and to know when to push treatment and when to let up on it according to the actual status. His latest summary of his technic and findings was published in the *München. med. Wchnschr.*, 1914, lxi, 69.

The Stinging Hairs of Plants

Recently Yount (THE JOURNAL, Oct. 10, 1914, p. 1315) reported sixteen cases of poisoning from *Jatropha macrorrhiza septemfida*, a small plant of the milk spurge family, growing in Arizona. The toxic properties of a related species, *Jatropha urens* (locally called "ortiga" and "chichicaste") have been discussed by Otto Lutz (*Science*, Oct. 23, 1914, p. 609). This plant, common in pastures along the Pacific Coast of Central America, on account of its poisonous effects has the reputation of being extremely dangerous. All parts, trunk, leaves, flowers and fruits, are covered with long, hard and glossy, stinging hairs, which protect the plant from cattle. The stinging hairs show the same structure as those of the common nettle (of the family *Urticaceae*), though the two plants belong to different families. The poison is produced by a cell of the epidermis which during the growth swells up, forming a goblet-shaped bulb, set into the surrounding tissue. The hair then represents a long tube, the walls of which have incrustations of silicates in the upper part and are calcified in the lower parts, so that they are very brittle and break at the lightest touch. Near the top this cell expands a little, in the form of a miniature hat with very thin walls, so that when touched, it breaks in an oblique direction, forming the point of a cannula, which enters the skin of animal or man. At the same time the poisonous liquid of the cell is discharged into the wound, and produces instantly a local inflammation. The mechanism is, in fact, the same as that of the poison fang of the snakes, and it is also similar to the cannula of the surgeon.

Lutz was poisoned by contact with about ten of the stinging hairs of ortiga, which he estimated to contain only about 0.00005 c.c. of the poison. The inflammation was similar to that produced by nettles, but the pain soon increased, the whole hand began to swell and inside of half an hour had assumed a monstrous shape. Then the left arm commenced to swell, also the right hand and arm, without having been inoculated, yet showed the same abnormal symptoms, and a very strong itching sensation was felt all over the upper part of the body. At about the same time parts of the face, around the eye and nose, swelled considerably. The itching sensation rapidly spread over the abdomen and the lower

extremities and red pimples appeared everywhere. In less than an hour the poison had extended over the whole surface of the body, and its entrance into the blood current was indicated by the corresponding physiologic reaction of the interior organs. The palpitation of the heart became extremely accelerated and the mind was soon overcome by an agonizing depression. The respiration seemed to be delayed as if under a great pressure, cold sweat broke out, and the patient gave way altogether, remaining unconscious for more than an hour, except for feverish dreams. After coming back to his senses, he had several fits of copious vomiting, from which it may be surmised that the poison was slowly eliminated from the organism. The weakness, however, remained for several days. Lutz suggests that the only way of allaying the effects of the poison would be to neutralize or precipitate it by means of a prompt application of chlorinated lime, ammonia or sodium permanganate.

Book Notices

Animal Experimentation and Medical Progress. By William Williams Keen, M.D., LL.D., Professor Emeritus of Surgery, Jefferson Medical College, Philadelphia, with an Introduction by Charles W. Eliot, LL.D., President Emeritus of Harvard University. Cloth. Price, $1.75 net. Pp. 312. Boston: Houghton Mifflin Company, 1914.

No one who has followed the discussion on animal experimentation and the opposition to it as a method of scientific research can be unfamiliar with the contributions of Dr. Keen on this subject. Three of the series of educational pamphlets on Protection of Medical Research issued by the American Medical Association in the last few years are from his able pen. In addition, he has contributed many articles to leading magazines and newspapers on this subject. Scientific men desiring this valuable material in convenient and accessible form, as well as laymen earnestly seeking the truth, will welcome the publication in a single volume of Dr. Keen's many contributions on this subject. The introduction by Ex-President Charles W. Eliot of Harvard University emphasizes the scientific value of experimental research and the ethical justification for such efforts for the alleviation of human suffering. Eight of the thirteen chapters in the book are devoted to the discussion of the value of animal experimentation in the development of modern medicine and surgery, the remaining chapters being given to a discussion of antivivisectionists' methods, and corrections of misstatements made by controversial writers on this subject. Not only on account of the high scientific and professional standing of the author, but also by reason of the brilliancy, clearness and fairness of presentation, Dr. Keen's book must long remain a recognized authority on animal experimentation and its value. The student, the teacher, the practicing physician and the philanthropic layman will all find it both interesting and instructive.

Optic Projection. Principles, Installation and Use of the Magic Lantern, Projection Microscope, Reflecting Lantern and Moving Picture Machine. By Simon Henry Gage, Professor of Histology and Embryology, Emeritus, Cornell University, and Henry Phelps Gage, Ph.D. Cloth. Price, $3. Pp. 731, with 413 illustrations. Ithaca, N. Y.: Comstock Publishing Company, 1914.

The increasing use of the stereopticon—or, more correctly, the magic lantern—both as a pastime and for more serious work is a sufficient excuse for this book, if any is needed. While there are a number of works on the subject, most of them are weak in one of two ways: Either scientific accuracy is sacrificed to practicality, or the practical is lost in a mass of abstruse technicalities. "Optic Projection" happily combines scientific accuracy with a simplicity of description that makes reading it a pleasure. The book should be of special value to the physician who is interested in projection apparatus. Whether the magic lantern is being used as a fascinating adjunct to amateur photography, or for more serious work of a scientific nature, great help will be found between the covers of this book. The use of the projection lantern with the electric current, with lime-light, with oil, gas, acetylene and alcohol lamps, is described in detail, separate chapters being devoted to the various illuminants. The projection of images of opaque objects, the preparation of lantern slides and the use of the microscope with the projection apparatus make material for three interesting chapters, while considerable space is given to drawing and photography with projection apparatus. Motion pictures, the projection room and screens and the optics of projection, also are described in turn. The last chapter of the book deals with the use of projection apparatus for demonstrating normal vision and refractive eye defects. An appendix gives a brief history of the development of projection apparatus, with a bibliography on projection. At the end of each chapter is a summary of its subject matter paragraphed in parallel columns telling what to do and what to avoid. The scope of the book is both practical and scientific; the language simple but accurate.

Food Products. By Henry C. Sherman, Ph.D., Professor of Food Chemistry, Columbia University. Cloth. Price, $2.25. Pp. 594, with illustrations. New York: The Macmillan Company, 1914.

This book is a compilation of a well-arranged mass of data concerning what we eat, together with recent scientific investigation and food legislation. After an elementary consideration of the chief constituents of foods, there is a chapter on the principles of food legislation, which embodies study of the food and drugs act, as well as state and municipal control. Following this, beginning with milk, chapters are devoted to various types of foods. The discussions are practical, timely and interesting. Especially important is the author's analysis of the duties of milk commissioners and milk inspectors. The holding method of pasteurization is commended highly, and the "flash" method is condemned. Following the chapter on milk—and the same plan is followed for other subjects—is a list of references to approved literature on the subject, including articles that have appeared in the current volumes of good American publications. There are numerous tables which give in compact form a vast quantity of comparative information concerning the products studied, and there are numerous illustrations and charts showing distribution and process of manufacture of some of the less known materials.

Worry and Nervousness or the Science of Self-Mastery. By William S. Sadler, M.D., Professor of Therapeutics, the Post-Graduate Medical School of Chicago. Cloth. Price, $1.50 net. Pp. 535, with 21 illustrations. Chicago: A. C. McClurg & Co., 1914.

This book may be classed as one of the better type of books written for the neurotic public. There is included in it a wealth of sane advice, and the author's experience is such as enables him to speak from a truly practical point of view. The average individual to whom the book is given will not in all probability give it the real study which its contents deserve. It is questionable whether the neurotic patient can be prevailed on to concentrate his mind on any literature. The book takes a modern sane view of the field of psychanalysis. Some of the illustrations cannot be said to add anything to the value of the work. However, it is a book which, like few others of its class, can safely be recommended to the clientele for which it was prepared.

The World's Social Evil. A Historical Review and Study of the Problems Relating to the Subject. By William Burgess, with a Foreword by Dr. Graham Taylor. Supplementary Chapter on a Constructive Policy, by Judge Harry Olson, Chief Justice, Municipal Court, Chicago. Cloth. Price, $1.50 net. Pp. 401. Chicago: Saul Brothers, 1914.

The foreword is essentially a review of the book. There is much material in the book, but the arrangement is not the best, and the various portions are rather disconnected. Dr. Taylor believes that the public sale of the book is a move in the right direction for only through publicity will the cure come. Physicians will doubt many of the theories presented in the chapter entitled "The War and the Weapons." Scriptural and Shakespearean quotations are not scientific evidence. The book will probably have a wide sale, for what is suppressed or forbidden is by human nature most desired.

Medicolegal

Reporting to Medical Club Patient as Slow Pay

(McDonald vs. Lee (Pa.), 91 Atl. R. 135)

The Supreme Court of Pennsylvania affirms a judgment on a verdict directed for the defendant, a physician, who sued for damages for an alleged libel. The court says that it appeared from the record that a number of physicians in Carlisle determined to prepare, for their own use, a list of the names of patients who were slow in making payment for medical services rendered to them. The information was for the benefit of the members of the medical association only, and there was no understanding between them that professional services should be refused to those whose names appeared on the list. The defendant was a member of the association, and she furnished to the secretary, among other names of persons whom she regarded as able to pay, but who were slow in making payments for services, the name of the plaintiff. The list of names thus reported as slow pay was printed by the association, with the number of the physician who furnished the name added. There was nothing on the face of the publication to indicate its purpose, and no one but a member could understand its meaning. The publication was considered confidential, and was limited to the members of the medical association. In the plaintiff's statement of claim there was no averment of any special damage to the plaintiff resulting from the publication, nor was there any proof of such damage. On the trial, at the close of the testimony, the judge gave binding instructions in favor of the defendant, on the ground that the communication was a privileged one, and there was no evidence of malice, nor was any special damage shown. The alleged libel was a communication made in confidence to and for the exclusive use of the members of the Carlisle Medical Club. It had reference only to the manner in which the plaintiff made payment for services rendered. It did not appear that, by reason of the report, credit was refused to the plaintiff, or that any member of the association refused to serve him in a professional way.

It was the duty of the trial court to determine whether or not the words used were libelous per se, or in and of themselves. If they were not, then, in the absence of special damage, binding instructions were proper. The Supreme Court can see no sufficient ground for holding the publication to be libelous per se, or in and of itself. If it became actionable by reason of some special damage occasioned thereby, that fact should have been alleged in the declaration, and proof thereof should have been offered on the trial. It was shown that the words used with respect to the plaintiff did not go beyond imputing to him slowness in the payment of his bills, and under the evidence it could hardly be claimed that he was prompt in the discharge of that duty. The accusation was not so serious in its character as to be fairly regarded as in itself libelous, and, if any injury was occasioned to the plaintiff thereby, it did not appear from the testimony. The good faith of the defendant in making the communication was not questioned. She had an interest in the subject-matter, and the communication was made to persons having a corresponding interest in the subject. In none of the assignments of error does the Supreme Court find anything of substantial merit or that would warrant a reversal of the judgment for the defendant.

Sanatorium Record Kept by Physician

(Mahegan vs. Faber (Wis.), 149 N. W. R. 397)

The Supreme Court of Wisconsin says, in this action to recover damages for the death of a man caused by an automobile, that he was a patient at a tuberculosis sanatorium for a time. He was examined by the superintendent of the institution when he was admitted, and from time to time thereafter, and a record was made of such examinations by the superintendent, a physician. The defendant sought to introduce the record in evidence, but the trial court excluded it. The superintendent testified that the record contained the information that he obtained from the patient for the purpose of treating him as a physician. It is quite obvious that the record made by the physician for this purpose was properly ruled out under the statute relating to privileged communications.

Hernia as a Result of a "Fortuitous Event"

(Zappala vs. Industrial Insurance Commission (Wash.), 144 Pac. R. 54)

The Supreme Court of Washington affirms a judgment in favor of the plaintiff for a hernia claimed to have been received under circumstances entitling him to relief under the workmen's compensation act. The claim was rejected by the commission on the ground that the hernia, derived from trying to start a heavily loaded truck, was not the result of some "fortuitous event" within the language of the act, which provides that the words "injury" or "injured," as used therein, refer only to an injury resulting from some fortuitous event as distinguished from the contraction of disease. The court says that the sustaining of an injury while using extreme muscular effort in pushing a heavily loaded truck is as much within the meaning of a fortuitous event as though the injury were the result of a fall or the breaking of the truck. To hold with the commission that if a machine breaks, any resulting injury to a workman is within the act, but if the man breaks, any resulting injury is not within the act, is too refined to come within the policy of the act as announced by the legislature in its adoption and the language of the court in its interpretation. The machine and the man are within the same class as producing causes, and any injury resulting from the sudden giving way of the one, while used as a part of any industry within the act, is as much within the contemplation of the act as the other. When the commission admits that the breaking of the truck because of the application of unusual force with resultant injury to the workman is covered by the act, then it must admit that the tearing of muscles or the rupture of fibers, or whatever it is that causes hernia, while exercising unusual effort, is likewise covered by the act; for there can be no sound distinction between external and internal causes arising from the same act and producing the same result. The American cases arising out of acts of this character sustain this court's conclusion that there is no distinction between the accident and a fortuitous event.

Waiver of Privilege by Plaintiff

(McKenney vs. American Locomotive Co. (N. Y.), 149 N. Y. Supp. 826)

The Supreme Court of New York, Appellate Division, Third Department, reverses a judgment entered in the plaintiff's favor, for error in excluding the testimony of a physician, sought to be adduced by the defendant, as to the condition of the plaintiff's eye prior to the accident by which he claimed to have been injured. The court says that a physician examined in behalf of the plaintiff may be asked on cross-examination whether he had not treated the patient for the same disease at a prior time. He may also be asked respecting what he learned on a subsequent examination, after his treatment at the time of the accident had ceased. This, of course, is on the assumption that the privilege had been waived by the plaintiff. The plain import of the plaintiff's testimony in this case was that the physician declined to treat his right eye after the accident because of its swollen condition, making it impossible for him to give such treatment. It would seem clear that this testimony would authorize the physician to swear that the eye was not swollen at that time, and also to swear what was its actual condition. Such was the evidence sought to be given by the defendant, and ruled out, as this court thinks, erroneously. That this testimony was very material was shown by the history of the case. The claim was that the injury produced a cataract. That there was a cataract in the eye was admitted. The defense claimed that it was a congenital cataract, one which had been there from birth, and not one caused by the accident. If so, the defendant should not be required to pay for the plaintiff's misfortune.

Society Proceedings

CHICAGO GYNECOLOGICAL SOCIETY

Meeting Held Dec. 18, 1914

Case of Pseudodiphtheritic Cystitis

The President, DR. ROBERT T. GILMORE, in the Chair

DR. ARTHUR CURTIS: A woman, aged 52, had had three normal births without any complication. A catheter or sound had never been passed. The history showed nothing that would indicate an artificial introduction of the organism into the bladder or kidney. About ten years ago two of her children had a virulent diphtheria. There was nothing of interest in the woman's history until the bladder trouble began, about two years ago. At that time she began to have some distress, but not extremely marked. A year ago last April there was noticed for the first time a marked distress on urination, the passage of small concretions from the bladder, and at quite frequent intervals blood in the urine, intimately mixed at times, and at other times passed without the amount of urine being in proportion to the blood. At the time of her first cystoscopic examination by me three or four months ago, the bladder picture was quite unusual. This was the first time any instrument had been passed into the bladder. Except for one very small area in the fundus, the bladder wall was absolutely covered with a thick membranous deposit. This membrane hung down from the fundus of the bladder, from the anterior walls and sides, just as stalactites hang from the walls of a cave. It was difficult to judge the thickness of the membrane, because it covered the entire bladder wall, but in some places it seemed almost an inch in thickness. The ureteral orifices could not be seen. The membrane could not be dislodged by massage or other manipulations. The bladder was washed out, and pieces of membrane that came away were examined, and showed a culture resembling the diphtheria bacillus. Cultures made from the urine showed a pure culture of the same organism. There seemed no doubt that we had to do with an absolutely pure infection with an organism of the diphtheria group, that is, the pseudodiphtheria bacillus. Vaccines were given for a period of about three months, with only moderately satisfactory results, so far as the symptoms were concerned. Two weeks ago the patient was again examined by cystoscope, at which time it was found that the membrane had disappeared in a great part of its extent. Dr. Watkins then performed a cystotomy. Very deeply in the mucosa of the bladder the examining finger found calcareous crystals, varying in size from 1/8 to 1/4 inch in diameter.

DISCUSSION

DR. THOMAS J. WATKINS: These crystal deposits were embedded so deeply in the mucous membrane that it was difficult to dislodge them. Some situated superficially were dislodged with the finger, and some were scraped away with a blunt curet, but it did not seem advisable to try to remove them all, on account of the great amount of traumatism which such a procedure would entail. We depended on drainage and the use of benzoic acid to get rid of the deposits that were deeply embedded. In these cases of cystotomies in the female it is difficult to obtain perfect drainage. With an ordinary vesicovaginal fistula it is difficult to prevent all the urine from escaping, and in these cases one may make an incision long enough to get two fingers in, and yet the urine will not all come away. It is a problem, therefore, whether it is better simply to depend on a linear incision, or to remove considerable of the mucous membrane of the vagina, so as to get drainage. It is impracticable to put any drainage material into the bladder, on account of the irritation which results. This woman has been kept on about 20-grain doses of benzoic acid daily, and the urine has become acid and more clear.

DR. ARTHUR CURTIS: In the majority of instances in which the patient is able to empty the bladder thoroughly, the establishing of drainage through a cystotomy or by irrigation is not ordinarily indicated. Either procedure is indicated only under very exceptional circumstances, such as in cases in which there is retention of urine.

Ovarian Tumors in Pregnancy; Report of Case of a Solid Tumor

DR. W. C. DANFORTH: The patient, a woman aged 32, was first seen by me when pregnant about three months. On examination, a mass about the size of a fetal head, hard and freely movable, was found on the left side of the abdomen. The fundus of the uterus was easily palpable about two fingers' breadth above the pubis. Five months earlier the patient had noticed a mass in the lower part of the abdomen, which she said had gradually increased in size. There had been slight bleeding about one week before I first saw the patient. A diagnosis was made of ovarian cyst accompanying pregnancy, and operation advised, consented to, and performed September 9, the tumor being excised. There were no adhesions; the tumor was attached to a pedicle about 4 inches long. It weighed 292 gm., was 10.5 cm. long, 8.5 cm. broad and 6.5 cm. thick. It was of an elongated spheroidal shape, white, firm and hard. The surface was covered by a thin, firm, glistening capsule. The cut surface was even and homogeneous, some tiny spaces being seen, which were probably due to the dropping out of small particles of tissue which had undergone myxomatous degeneration. Microscopically, the mass proved to be a fibromyoma, which had undergone myxomatous degeneration. One portion of the mass was composed of almost pure unstriped muscle tissue. The patient made an uneventful recovery. Nothing was heard of the subsequent labor, but as it was the third pregnancy, and the former labors had been normal, it is supposed that it presented nothing out of the ordinary.

Solid tumors of the ovary are not at all common, and are particularly rare in connection with pregnancy. The prognosis in these cases of ovarian tumor associated with pregnancy, so far as the mother is concerned, depends largely on the location of the tumor, the promptness with which it is recognized, and the skill of those attending the woman. The complication most to be feared is twisting of the pedicle, but these patients almost always may be saved by prompt operation. If an ovarian tumor is recognized during pregnancy, the proper mode of procedure is its immediate removal. The danger to the mother is slight and the risk to the fetus is greatly lessened. Removal by means of an abdominal incision is usually the method of preference, although a few writers urge the vaginal route. The percentage of abortion seems to be much more favorable in the cases subjected to laparotomy than in those subjected to vaginal section. If the case has been handled in any but the most aseptic manner, the tumor should be pushed up out of the pelvis, if possible, and delivery accomplished either spontaneously or operatively through the vagina. Delivery by forcefully extracting the child alongside the mass should never be attempted. If reposition is impossible, puncture or incision and drainage of the tumor, if it be a cystic one, should be done, after which delivery should be accomplished as speedily as possible, and the sac removed by abdominal incision or colpotomy within twenty-four hours. If the case is a clean one, in a well-conducted hospital, the mass may be removed at once by laparotomy and delivery accomplished by hysterotomy or from below at once. In cases in which labor has not begun, or in which there is little or no dilatation, my inclination is toward delivery by cesarean section.

DISCUSSION

DR. THOMAS J. WATKINS: It would be a difficult and possibly unwise plan to set down definite rules to follow in the treatment of these cases. It should be very largely a question of determination in individual cases, depending on the facts with which we are all familiar. I think it would be unwise to remove an ovarian cyst as soon as found. The better method would be to let the pregnancy

go on to term, remove the cyst, and do a cesarean section at the same time, or do the cesarean section first and then remove the tumor, to facilitate the operative technic. However, this would have to be determined in individual cases by the size of the tumor and local conditions, such as access to a good hospital.

DR. RUDOLPH W. HOLMES: We should not determine that we should operate in a specified manner on an ovarian tumor. It is not so much the size of the tumor as its location that is going to cause trouble during the pregnancy, or more particularly at the time of delivery. A small ovarian tumor, lodged in the culdesac, adherent, may offer insurmountable difficulties to spontaneous labor, whereas a very large tumor may be so located that without any complications or disturbances, labor will go on to a spontaneous conclusion. Therefore, it is more the location than the actual size of the tumor. There is a great deal of risk of infection in cases of dermoid cyst especially, and it is very difficult at times to determine whether we have to deal with a dermoid or not. On the suspicion of a dermoid, the sooner out the better. The ideal time to remove tumors ordinarily is at the time of labor, if they in any degree suggest interference with labor. If the tumor is to be removed at or about the time of labor, and cesarean section is to be performed, the section should be done first, because immediately with the emptying of the uterus there is a diminution of the blood supply through the vessels of the pelvis, and therefore the hemorrhage, if there is any, is more easy of control.

DR. CHANNING W. BARRETT: The differentiation of a solid tumor of the ovary or solid tumor of the uterus is an important one, because it is agreed that ovarian tumors should be removed nearly always when found, while fibroids of the uterus, for apparent reasons, should be left alone until they are giving trouble.

DR. W. C. DANFORTH: As to the sequence of the operations, cesarean section and removal of the tumor, doing the section first and removing the tumor afterward is, in my opinion, the logical procedure.

Current Medical Literature

AMERICAN

Titles marked with an asterisk (*) are abstracted below.

American Journal of Medical Sciences, Philadelphia

December, CXLVIII, No. 6, pp. 781-936

1 *Comparison of Results of Phenolsulphonephthalein Test of Renal Function with Anatomic Changes Observed in Kidneys at Necropsy. W. S. Thayer, Baltimore, and R. R. Snowden, Pittsburgh.
2 *Pathologic Evidence of Relationship of Gastric Ulcer and Gastric Carcinoma. L. B. Wilson and I. E. McDowell, Rochester, Minn.
3 Studies in Pernicious Anemia. H. C. Moffitt, San Francisco.
4 Anastalsis and Surgical Therapy of Colon. J. M. Lynch and J. W. Draper, New York.
5 *Subcutaneous Injection of Oxygen as Therapeutic Measure. J. McCrae, Montreal.
6 New Growths Involving Terminal Bile and Pancreatic Ducts: Their Early Recognition by Means of Duodenal Content Analyses. B. B. Crohn, New York.
7 *Absorption of Protein and Fat after Resection of One-Half of Small Intestine. W. W. Palmer, Boston.
8 Roentgenologic Method of Differentiating Between Ulcer and Cancer of Stomach and Duodenum. A. F. Holding, New York.
9 *Diastolic and Pulse-Pressure. L. M. Warfield, Milwaukee, Wis.
10 Centrifuge Method to Provide Uniform Standard for Wassermann Readings. B. B. V. Lyon and J. Eiman, Philadelphia.

1. **Phenolsulphonephthalein Test.**—The observations made by Thayer and Snowden show in severe chronic nephritis, a uniformly low phenolsulphonephthalein output which, as a rule, in those instances not interrupted by an acute terminal process, decreases steadily up to the onset of uremia and is nearly or wholly suppressed from a day or two to a month before death. Acute terminal processes which may be unsuspected clinically, are common, and here a sudden diminution in the elimination of phenolsulphonephthalein may come on in cases in which the percentage previously excreted is not so low as to appear menacing. In not a single instance have the authors met with a case of severe chronic nephritis with a good phenolsulphonephthalein elimination. Chronic passive congestion (cardiac disease) results often in a considerable reduction in the two hours' elimination of phenolsulphonephthalein. The results are very variable in individual cases. In marked decompensation the phenolsulphonephthalein output may be reduced to but a trace in two hours; but the excretion is, as a rule, rapidly restored with the reestablishment of circulatory compensation. These observations are in agreement with the experimental studies of Rowntree and Fitz.

In the few instances of chronic nephritis of moderate extent which are included among these cases the excretion of phenolsulphonephthalein was uniformly considerably reduced. All of these cases, however, were associated with chronic passive congestion of considerable extent, but the percentage of phenolsulphonephthalein was lower than might have been expected with an uncomplicated passive congestion. In one instance of acute nephritis and in one instance of pure amyloid disease the phenolsulphonephthalein excretion was greatly reduced. The cloudy swelling observed in acute infections was in some instances associated with considerable reduction in the phenolsulphonephthalein output.

2. **Gastric Ulcer and Carcinoma.**—Of 399 cases of gastric cancer from which the tissue containing the primary lesion was resected in the Mayo clinic, 4.8 per cent. showed ulcer with doubtful cancer in the border, 15.8 per cent. showed ulcer with positive early cancer in the borders only of the lesion, 36.8 per cent. showed ulcers with advanced cancer, while 42.6 per cent. of the cases showed cancer in which the previous ulcer formation is doubtful. Of 46 cases of gastric cancer from which the tissue containing the primary lesion was obtained at necropsy, 1 case (2.2 per cent.) showed an ulcer with doubtful cancer, 7 cases (15 per cent.) showed ulcer with advanced cancer while in 38 cases (82 per cent.) the evidence of ulcer previous to cancer formation is doubtful.

The clinical and pathologic data in relation to the development of gastric cancer or gastric ulcer are in close agreement: (a) with regard to the average age at operation; (b) with regard to the average period of previous history suggestive of ulcer, and (c) with regard to the average number of months of acute history. To Wilson and McDowell it seems probable, from a careful study of the clinical and pathologic evidence of this series of cases, that gastric cancer rarely develops except at the site of a previous ulcerative lesion of the mucosa.

5. Abstracted in THE JOURNAL, June 13, 1914, p. 1924.

7. **Absorption of Protein and Fat.**—Absorption studies after resection of the lower half of the small intestine are reported by Palmer. He found the loss of nitrogen in the stools is four or five times that of normal individuals. The loss in fat in the stools is five to six times the normal loss. A high urinary indican, 800 mg. is reported. Ammonia forms a much larger part of the urinary nitrogen than in normal individuals. This is probably due to the extensive putrefaction taking place in the intestine. The success with which a large portion of the intestine may be removed depends to a large degree on the condition of the intestine remaining. This fact Palmer believes to be important and should be considered carefully before extensive resections are undertaken. Palmer says that a diet low in fat and moderately low in protein should be given in cases in which much intestine has been removed.

9. **Diastolic and Pulse-Pressure.**—Of forty-nine cases of myocardial insufficiency at all ages observed by Warfield the average pulse-pressure was 40 mm. The highest was 70, the lowest 15 mm. He has seen cases of myocardial disease with normal blood-pressure figures, five minutes before death. In seventy-five cases of chronic nephritis the average pulse-pressure was 62 mm. The ages of the patients ranged from 10 to 82 years. The highest pulse-pressure, 130 mm. occurred in a man, aged 55 years. A child, aged 10 years, had at one period of her stay in the hospital systolic 186, diastolic 154, pulse-pressure 32. She left the hospital improved and with

130, 80, 50 as her pressure. The most consistent low pulse-pressures were in the advanced cases of pulmonary tuberculosis. Also in typhoid during the third, fourth and fifth weeks, when the fever lasts that length of time, the whole pressure picture is reduced, but the pulse-pressure is reduced relatively more than diastolic pressure.

Warfield has taken for low pulse-pressure any below 30, for high any above 50. The pulse-pressure in aortic insufficiency is always large; in fact, it is usually the largest in any disease. In chronic nephritis the pulse-pressure is always high in the compensation stages. In some forms of arteriosclerosis the pulse-pressure is high. In myocardial insufficiency it varies. If the heart is large there is increased pulse-pressure, if the heart is small there is decreased or normal pulse-pressure. In pulmonary tuberculosis the pulse-pressure is low in the advanced cases. In the early cases the blood-pressure picture, as a rule, is normal or generally decreased. If the heart is large naturally the blood-pressure picture takes on more the form of that in cases of enlarged heart with general depression of the blood-pressure picture. In the acute fevers the pressure picture in the initial stages shows no particular changes. As the cases develop the whole pressure picture as a rule shows a general depression and a low pulse-pressure usually means a badly diseased heart and is an unfavorable prognostic sign.

In general when the systolic pressure is normal, increased pulse-pressure signifies peripheral dilatation. When the systolic pressure is high the increased pulse-pressure is to be regarded as normal and has no special significance. Decreased pulse-pressure or even normal pulse-pressure means marked peripheral constriction, and is therefore, an unfavorable prognostic sign. With low systolic pressure increased pulse-pressure occurs in practically only one condition, aortic insufficiency. With normal systolic pressure gradually decreasing pulse-pressure usually means cardiac failure. The condition is seen often in the later stages of the high systolic increased pulse-pressure cases. With low systolic pressure increased pulse-pressure usually means general cardiac weakness, as seen in febrile conditions or in convalescence from long illnesses or in cachexia of malignant disease.

Annals of Otology, Rhinology and Laryngology, St. Louis

September, XXIII, No. 3, pp. 523-754

11 Results of Operation (Laryngofissure) for Intrinsic Cancer of Larynx. E. Schmiegelow, Copenhagen.
12 Tuberculosis of Middle Ear. H. H. Briggs, Asheville, N. C.
13 Aural Complications in Typhoid. E. M. Holmes, Boston.
14 Cauterization of Mucous Membranes, Particularly of Nasal Mucosa —Protest. E. deW. Wales, Indianapolis.
15 Case of Suppurative Thyroiditis with Perforation of Trachea. 2. Unusual Infection of Epiglottis and Larynx in Child—Tracheotomy—Recovery. C. F. Theisen, Albany, N. Y.
16 Importance of Disturbed Metabolism in Etiology of Secretory Middle Ear Conditions. J. E. Sheppard, Brooklyn.
17 Case of Chronic Meningitis Possibly of Otitic Origin. J. J. Thomson, New York.
18 Vaccines in Chronic Ear Infections. Report of Cases. W. H. Haskin, New York.
19 Two Obscure Cases of Resolving Mastoiditis—Operative Indications. H. B. Blackwell, New York.
20 Report on Twenty-Six Cases of Tonsillectomy, Two and A Half Years After Operation. A. Lewy, Chicago.
21 Double Radical Mastoidectomy in Dementia Praecox with Phenomenal Improvement in Mental and Physical Conditions. G. E. Davis, New York.
22 Furunculosis of Ear with Treatment by Vaccines. H. B. Brown, New York.
23 Labyrinthine Studies. J. A. Babbitt, Philadelphia.
24 Pemphigus Involving Primarily Mouth and Throat. Report of Cases. R. Sonnenschein, Chicago.

Archives of Internal Medicine, Chicago

December, XIV, No. 6, pp. 769-920

25 *Clinical Studies in Caffein. L. Taylor, Cleveland.
26 *Postanesthetic Glycosuria as Influenced by Diet, Body Temperature and Purity of Ether. E. L. Ross, Chicago, and P. B. Hawk, Philadelphia.
27 Complement-Deviation Test with Besredka's Tuberculin and Occurrence of Tuberculosis Among Syphilitics as Diagnosed by this Test. J. Bronfenbrenner, Pittsburgh.
28 *Two Hepatic Functional Tests. W. R. Sisson, Boston.
29 *Effect of Theobromin Sodium Salicylate in Acute Experimental Nephritis, as Measured by Excretion of Phenolsulphonephthalein. H. A. Christian, Boston.
30 Nitrogen Metabolism and Significance of Non-Protein Nitrogen of Blood in Experimental Uranium Nephritis. H. O. Mosenthal, Baltimore.
31 *Family Periodic Paralysis. T. Diller and J. Rosenbloom, Pittsburgh.
32 *Incidence of Status Lymphaticus in Dementia Praecox. H. Emerson, New York.
33 *Artificial Pneumothorax. G. B. Webb, G. B. Gilbert, T. L. James and L. C. Havens, Colorado Springs, Colo.
34 *Effect of Strychnin, Caffein, Atropin and Camphor on Respiration and Respiratory Metabolism in Normal Human Subjects. D. L. Edsall and J. H. Means, Boston.
35 Physiology of Otic Labyrinth. J. G. Wilson, Chicago, and F. H. Pike, New York.

25. **Studies in Caffein.**—Fifteen patients suffering from advanced myocardial diseases were selected by Taylor for this study. Every case showed some sign of broken compensation at the time of the experiment, and thirteen gave evidence of retained body fluid. Dyspnea was present in 14 cases; edema of the extremities in 13 cases; ascites in 10 cases; hydropericardium and hydrothorax, single or double, in 6; tender pulsating liver in 6. Other common symptoms were cough, frontal headache, weakness, dizziness and substernal pain. All patients were kept in bed on a constant diet. Of the 15 cases the results were excellent in 8, moderate in 4, and there was no result in 3. In one of the cases in which there was no result, the vomiting and loss of sleep even on small doses more than balanced any possible good that the drug could have done. All the cases with limited results showed the nervous signs, so the absorption of the drug was assured.

In five of these cases a second admission to the hospital or a return of symptoms while they were still in the institution made it possible to try the comparative therapy of theobromin sodium salicylate under the same conditions and on the same heart on which the caffein action had been tested. Its action on the urinary outflow is more prompt than that of caffein and the diuresis is larger. The theobromin sodium salicylate action is equally well sustained and usually at a higher level than the caffein. When caffein has a depressing effect on the vasomotor system and lowers the blood-pressure, theobromin sodium salicylate first elevates the pressure and then later lowers it.

Eighty grains a day is a normal clinical dose. Patients will tolerate this dose easily. Not only is the theobromin sodium salicylate action prompter, much stronger and equally well sustained, but it exhibits none of the gastric and nerve disturbances attendant on caffein. In cases with edema, the diuretic effect of caffein may be taken safely as a sign of an improved mass movement of blood, which is the result desired. From this point of view it is evident that small doses are not adequate. The best results are obtained with full doses.

Therefore, Taylor concludes that in myocardial insufficiency with retained body fluid, caffein causes: a moderate increase in the urine output with a proportional loss of body weight. This increase reaches its maximum on the fourth day; a drop in both the systolic and diastolic blood-pressures which may stand in a causal relation to the diuretic coefficient, contrary to the usual teaching; a slight (3.6 per cent.) temporary rise in the pulse-rate, but no permanent change in either the pulse or respiratory rate; a moderate relief of the cardiac symptoms; the constant appearance of distressing nervous and gastric symptoms. The clinical diuretic action of caffein may be better performed by large doses of theobromin sodium salicylate without the unpleasant side effects.

26. **Glycosuria as Influenced by Diet, Body Temperature and Purity of Ether.**—It is claimed by Ross and Hawk that the reduction of body temperature during ether anesthesia does not of itself cause glycosuria. The reduction to a minimum of the oxygen content of the ether vapor inhaled does not cause glycosuria. The response of the animal body to "dehydrated" ether (that is, ether from which aldehyd and other impurities have been removed) in so far as glycosuria is concerned, is no different from the response to the ether ordinarily used for anesthetic purposes. The inhalation of ether administered by the cone method causes a more pronounced reduction in body temperature than does the

inhalation of the same kind of ether for a similar period when administered by the so-called improved method. The dryness of the ether vapor in the cone method is the contributing factor. The inhalation of either "dehydrated" or common ether for a period of two hours by dogs fed a carbohydrate-free diet was in every instance accompanied by glycosuria. When the same animals were fed a mixed diet glycosuria was not in evidence. There was no evidence of "emotional" glycosuria, the factor regulating the occurrence or non-occurrence of glycosuria in every instance being a dietary one.

28. **Two Hepatic Functional Tests.**—The results of Sisson's studies with phenoltetrachlorphthalein show that the normal output of the dye in the feces is about 35 per cent. The inapplicability of the test to cases with evidence of biliary stasis makes its scope limited. The galactose test, however, may be of great value in differentiating icterus catarrhalis from other hepatic conditions showing biliary stasis. It is rarely positive in cases of cirrhosis of the liver showing no evidence of biliary stasis. There is no apparent relation between the excretion of galactose and phenoltetrachlorphthalein. Judging from the experimental studies and from the clinical observations noted up to this time, it seems to Sisson that a more exhaustive application of the test is justified. It offers a means of diagnosing certain cases of cirrhosis of the liver and of neoplasms of this organ. The results obtained may also be of some prognostic value.

29. **Effect of Theobromin Sodium Salicylate in Acute Experimental Nephritis.**—So far as renal function may be judged from phenolsulphonephthalein excretion in acute experimental nephritis produced by uranium in the rabbit, Christian says, there is no evidence that theobromin sodium salicylate exerts any constant beneficial action. In the severer forms there is almost no evidence of beneficial action; in the very mild forms there is occasionally evidence of beneficial action, but this is too inconstant to justify the conclusion that theobromin sodium salicylate really improves renal function even in the very mild forms of acute nephritis.

The results obtained in the rabbit are in accord with the common clinical teaching that diuretics are not indicated in acute nephritis in man; but they are no proof of the correctness of this teaching, for results obtained in rabbits cannot be directly read in terms of man. However, they would seem to lend some further support to the view based on clinical observation that diuretics are not indicated in acute nephritis.

31. **Family Periodic Paralysis.**—The clinical history and a metabolism study of seven days' duration on the Folin diet is described by Diller and Rosenbloom in a case of family periodic paralysis. They studied the nitrogen metabolism and urinary nitrogen partition (total nitrogen, urea nitrogen, ammonia nitrogen, uric acid nitrogen, creatinin nitrogen and undetermined nitrogen), the sulphur metabolism and urinary sulphur partition (total sulphates, inorganic sulphates, ethereal sulphates and neutral sulphur), the calcium, magnesium, phosphorus and fat metabolism. The only decided metabolic changes found was a marked decrease in the amount of creatinin and creatinin nitrogen excreted in the urine and a marked increase in the amount of undetermined nitrogen of the urine.

32. **Incidence of Status Lymphaticus in Dementia Praecox.**—Emerson examined 208 men from 16 to 50 years of age definitely classed as having dementia praecox, among whom sixty-one were found to exhibit the typical physical characteristics of status lymphaticus (29.3 per cent.); 147 were found to be physically normal (70.6 per cent.).

33. **Artificial Pneumothorax.**—The authors' report deals with experiences and results with artificial pneumothorax, and with a series of gas analyses and animal experiments in regard to the use of air or nitrogen. During the past two years the attempt has been made to produce an artificial pneumothorax in eighty-three patients with advanced pulmonary tuberculosis. In two cases the method of Brauer was attempted, in all others that of Forlanini. The apparatus and method of procedure were practically similar to those so well described by Robinson and Floyd, and by Hamman and Sloan.

The authors conclude that the procedure of artificial pneumothorax is of undoubted value in many advanced cases of pulmonary tuberculosis. The dangers in its application with proper precautions would seem negligible. The necessity for keeping up the compression over a long period of time is a serious drawback, as is also the possible annoyance to the patient of the development of fluid. They urge that for the present every known method should be very thoroughly tried out before suggesting pneumothorax to patients. The compression should be kept up for probably several years. The authors' experiments on monkeys showed that little if any advantage is to be gained by the employment of nitrogen rather than atmospheric air for the production of artificial pneumothorax.

34. **Effect of Strychnin, Caffein, Atropin and Camphor on Respiration.**—Edsall and Means summarize their findings as follows: Strychnin: No action on the respiratory center or circulation, possibly an increase in metabolism. Caffein: Stimulation of respiratory center, moderate increase in metabolism, no effect on circulation. Atropin: Marked increase in metabolism, in doses large enough to cause the classical action on the circulation. Marked drop in the calculated values for alveolar carbon dioxid and rise in alveolar ventilation. Whether these latter effects are due to stimulation of the respiratory center or to changes in the dead space is not clear at the present writing. Camphor: The results not agreeing, no conclusions are justifiable.

Arizona Medical Journal, Phoenix

December, II, No. 11, pp. 7-19

36 Year's Experience with Pericolic Membranes. E. C. Moore, Los Angeles.
37 Gastro-Enterostomy, Its Indications and End Results. S. D. Swope, Deming, N. Mex.

Boston Medical and Surgical Journal

December 24, CLXXI, No. 26, pp. 955-994

38 Forlanini's Artificial Pneumothorax. G. M. Balboni, Boston.
39 Action of Pituitrin on Acute Heart Failure and Incompensate Heart Lesions. E. Zueblin, Baltimore.
40 Mastitis in Pregnancy. Report of Case. B. R. Whitcher, West Somerville.

December 31, No. 27, pp. 995-1026

41 *Analysis of Recoveries at Psychopathic Hospital, Boston. T. H. Haines, Columbus, O.
42 *Subnormal Temperature in Tuberculosis. A. K. Stone, Boston.
43 Coccygodynia: Causes and Treatment. R. Duffy, Tampa, Fla.

41. **Analysis of Recoveries at Psychopathic Hospital.**—A second series of 100 cases, considered especially from the point of view of psychopathic nursing of brief manic-depressive excitements and of hysteric and other deliria is presented by Haines. Forty persons about 40 years of age recovered. There were three in the fifth decade who were not alcoholic, and four above 50 who were not alcoholic. The list of the second 100 recoveries includes 111 admissions and 106 recoveries. Nine patients were admitted twice and one three times. Eighty-two of the total number of admissions are psychoses directly due to alcohol.

Of the alcoholics only 21 per cent. were females, and all these were married, while only 45 per cent. of the alcoholic males were married. Alcoholic hallucinosis requires, on the average, twice the time necessary for delirium tremens to clear up. Eighteen and 7 per cent. of all "recoveries" among alcoholics came voluntarily to the hospital. Twenty-six of these 106 "recoveries" or 24 per cent. are from psychoses not attributable to alcohol. The large number of patients suffering from serious disturbances of metabolism and at the same time insane but recoverable, as shown by the outcome, demonstrates the unique field of service of psychopathic nurse and psychopathic hospital. Anomalous Wassermann reactions, in some cases in which the psychoses seem in no ways attributable to syphilitic infection, raise interesting problems in psychiatry. Others, in which alcohol and syphilis seem to work together, open up problems in the permutations of the symptoms of two groups.

42. **Subnormal Temperature in Tuberculosis.**—In tuberculosis cases, Stone says that at a certain period of the disease, usually succeeding the active febrile stage, there is often a period when the temperature curve shows marked excursions in the subnormal, the temperature at no time rising above 98.6 degrees, and rarely fully reaching this point. The patients during this period of subnormal temperature are usually improving and making distinct gains, but it takes very little to give them exacerbations of real febrile temperature, lasting from a few hours to a few days. This period of subnormal temperature may last for weeks, the curve becoming less and less irregular if the improvement continues, and finally becoming a continuous straight line at 98.6 degrees. Until this latter condition is found, Stone does not allow his patients much more latitude in their movements than while in an active febrile stage. When there is a constant variation of the temperature from the normal, it means that there is a pathologic process going on in the body, which may not be accounted for; that, however, is ignorance, and not because the patient is in a truly normal condition. The persistent subnormal temperature has become to Stone a part of the regular course of a case of tuberculosis that is on the whole progressing favorably. It does not have prognostic value, as a patient may from this stage again become febrile; although on the whole the tendency is, under favorable conditions, for the temperature curve to become a practically straight line.

Florida Medical Association Journal, Jacksonville

December, I, No. 6, pp. 161-192

44 Acute Inflammation of Pelvic Organs. G. R. Holden, Jacksonville.
45 Pathologic Vaginal Discharges. T. S. Field, Jacksonville.
46 *Unsuccessful Attempt to Provoke Vomiting. Report of Case. F. J. Walter, Daytona.
47 Should Physician Dispense His Own Remedies? A. H. Freeman, Starke.
48 Facial Paralysis Occurring in Treatment of Syphilis. J. L. Kirby-Smith, Jacksonville.

46. **Unsuccessful Attempt to Provoke Vomiting.**—After using an esophageal expanding hair probang unsuccessfully four times in his case Walter decided to try emesis, hoping to dislodge the substance in this way. Titillation of the throat and epiglottis was tried several times without result. The patient was given an emetic dose (4 to 6 drams) of syrup of ipecac. In thirty minutes he was given 20 grains of zinc sulphate, followed in fifteen minutes by a large tablespoonful of pulverized mustard in an equal quantity of lukewarm water. In ten minutes 20 grains of zinc sulphate was repeated and in five minutes more mustard (amount not certain). At this time two pints of lukewarm water were given, all of which produced no emesis. In ten minutes $\frac{1}{10}$ grain of apomorphin hydrochlorate was subcutaneously injected with no result, except in fifteen minutes a tendency to be a bit stupid. A second dose of apomorphin of $\frac{1}{10}$ grain was given without the slightest nausea.

Walter washed the stomach out with two quarts of warm water, hoping at the time for some reaction by means of the tube. The man became weak, relaxed and was perspiring from the apomorphin and the ordeal. He was put to bed and allowed to sleep. In one hour and thirty minutes he awakened gulping (not vomiting) up a piece of tough, irregular roughened cartilage the size of an egg with entire relief. This case is of interest, first, because so large a mass could exist and not be disturbed by probang or stomach tube unless a diverticulum were present (symptoms of which there were none other than the above); second because of the quantity and the variety of emetics given without the slightest result, and third because of the manner in which the cartilage was finally ejected.

Georgia Medical Association Journal, Augusta

December, IV, No. 8, pp. 227-255

49 Two Cases Presenting Symptoms of Mucous Colitis. G. P. Huguley, Atlanta.
50 Perforating Appendicitis—Surgical Technic After Treatment. R. R. Kime, Atlanta.
51 Posture of Human Body: Its Relation to Health and Efficiency. F. G. Hodgson, Atlanta.
52 Keratitis Parenchymatosa. M. M. Stapler, Macon.
53 Case of Taenia Nana. J. B. Ward, Macon.
54 Pernicious Malarial Fever. T. D. Coleman, Augusta.

Journal of Cutaneous Diseases, New York

December, XXXII, No. 12, pp. 821-884

55 Case of Miliary Lichen Planus with Unusual Clinical and Pathologic Findings. I. R. Pels, Baltimore.
56 *Lesions Produced by Bite of "Black Fly" (Simulium Venustum). J. H. Stokes, Ann Arbor, Mich.

56. **Lesions Produced by Bite of Black Fly.**—The principal positive result of the work detailed by Stokes has been the experimental reproduction of the lesion produced by the black fly in characteristic histologic detail by the use of preserved flies. The experimental lesions not only reproduced the pathologic picture, but followed a clinical course, which in local symptomatology especially, tallied closely with that of the bite. This the author interprets as satisfactory evidence that the lesion is not produced by any living infective agent. The experiments performed do not identify the nature of the toxic agent. Tentatively they seem to bring out, however, the following characteristics: The products of alcoholic extraction of flies do not contain the toxic agent. The toxic agent is not inactivated by alcohol, is not destroyed by drying fixed flies, is not affected by glycerin, but is, if anything, more active in pastes made from the ground fly and glycerin, than in the ground flies as such. It is rendered inactive or destroyed by hydrochloric acid in a concentration of 0.25 per cent., is most abundant in the region of the anatomic structures connected with the biting and salivary apparatus (head and thorax), is not affected by a 0.5 per cent. solution of sodium bicarbonate nor by exposure to dry heat at 100 C. for two hours. It is destroyed or rendered inactive in alkaline solution by a typical hydrolytic ferment pancreatin. Incomplete experimental evidence suggests that the activity of the toxic agent may be heightened by a possible lytic action of the blood serum of a sensitive individual, and that the sensitive serum itself may contain the toxic agent in solution.

The following working theories have suggested themselves to Stokes: First, the toxin may be an alkaloidal base, toxic as such, and neutralized after injection by antibodies produced for the occasion by the body. Second, it is conceivable that the injected saliva of the fly does not contain an agent toxic as such; that, like many foreign proteins, it only becomes toxic when broken down. Third, lytic agents in the blood serum may play the chief rôle in the liberation of the toxic agent from its non-toxic combination. This view is the one to which the author inclines as the one which most adequately explains the phenomena. Fourth view, that the initial injection of a foreign protein by the fly (namely, with the first bite) sensitizes the body to that protein.

Journal of Nervous and Mental Disease, Lancaster, Pa.

December, XLI, No. 12, pp. 745-818

57 Autonomic or Vegetative Nervous System. W. Timme, New York.
58 Normal-Looking Brains in Psychopathic Subjects. E. E. Southard and M. M. Canavan, Boston.

Journal of Outdoor Life, New York

December, XI, No. 12, pp. 353-383

59 Review of Cure at a Sanatorium. A. A. Pleyte, Wales, Wis.
60 Making Convalescents Pay by Pheasant Raising. J. W. Talbot, South Bend, Ind.
61 What, How and Why of a County Hospital. E. A. Moree, New York.
62 Making Disease Prevention Popular. W. D. Thurber, Indianapolis.
63 Referendum Campaigns for County Tuberculosis Hospitals. G. J. Nelbach, New York.

Kansas Medical Society Journal, Topeka

July, XIV, No. 7, pp. 249-286

64 History of Obstetrics. L. V. Sams, Topeka.
65 Good Result Following Elliott Trephine Operation for Acute Glaucoma. H. C. Markham, Parsons.
66 What Is Wrong with Medical Profession of Kansas. C. S. Huffman, Columbus.

August, No. 8, pp. 287-324

67 Treatment of Some Effects of Roentgen Ray Burns. J. C. McClintock, Topeka.
68 Prostatic Hypertrophy. M. Trueheart, Sterling.
69 Chronic Intestinal Stasis. J. T. Axtell, Newton.

70 Medical Legislation and Other Things Needed in Kansas. E. C. Duncan, Fredonia and J. W. McGuire, Neodesha.

November, No. 11, pp. 403-440

71 Pseudoleukemia. E. L. Uhl, Baldwin.
72 Acute Otitis Media. J. F. Gsell, Wichita.

Maine Medical Association Journal, Portland

September, V, No. 2, pp. 57-84

73 Air We Breathe. T. Hubbard, Toledo, O.

October, No. 3, pp. 85-124

74 Treatment of Diseases of Vegetable Parasitic Origin by Deep Muscular Injections of Mercury. B. L. Wright, U. S. Navy.

November, No. 4, pp. 125-160

75 Medical Inspection of Schools in Auburn, H. E. Hitchcock, Auburn.
76 Heart Stimulation. C. H. Hunt, Portland.
77 Early Diagnosis of Pulmonary Tuberculosis. W. E. Gray, Milltown, N. B.
78 Comments on Hospital Abuses. S. F. Greene, Solon.

New York Medical Journal

December 26, C, No. 26, pp. 1245-1288

79 Hysteric Astasia-Abasia Occurring in Acute Multiple Neuritis. C. W. Burr, Philadelphia.
80 Physical Defects Factor in Cause of Crime. E. W. Lee, New York.
81 Physical Defects and Crime. J. H. Branth, New York.
82 Intracapsular Extraction. C. B. Meding, New York.
83 Radium and Roentgen Therapy Facilitated by Double Coated Adhesive Plaster. S. Tousey, New York.
84 Gonococcus Infection in Women. J. J. France, Portsmouth, Va.
85 Syphilis in Rôle of Malignant Neoplasms. J. C. O'Day, Portland, Ore.
86 Wounds of Arteries. S. Erdman, New York.
87 Industrial Sanitary Standards. G. M. Price, New York.
88 Tuberculosis of Tongue. J. Weinstein, New York.

January 2, CI, No. 1, pp. 1-48

89 Pneumococcus Infection and Immunity. R. I. Cole, New York. (To be continued.)
90 Psychical Aspect of Syphilis. H. G. Klotz, New York.
91 Appendicitis Under Field Service Conditions. A. W. Williams, Washington, D. C.
92 Psychology of War. W. L. Howard, Westboro, Mass.
93 Drug Habit and Legislation. J. B. Woodhull, North Bennington, Vt.
94 Acute Articular Rheumatism. A. C. Reed, Changsha, China.
95 Healed Tuberculosis of Tongue, Larynx and Lungs. F. M. Pottenger, Monrovia, Cal.
96 Spontaneously Precipitated Albumin in Urine. J. Rosenbloom, Pittsburgh.
97 Primary Nasal Diphtheria. H. A. Schatz, Philadelphia.

New York State Journal of Medicine

December, XIV, No. 12, pp. 555-594

98 Present Status of Vaccine Treatment in Acute Suppurative Infections. C. Norris, New York.
99 *Some Methods in Treatment of Puerperal Infection which Have Given Improved Results. R. R. Huggins, Pittsburgh.
100 Retrodeviations of Uterus in Puerperium and in Nulliparous Women. F. C. Goldsborough, Buffalo.
101 *Care of Abdomen in Infancy and Childhood. E. M. Mosher, Brooklyn.
102 *Fracture of Neck of Femur: Its Treatment. J. B. Walker, New York.
103 Subacute and Chronic Enteric Infection. E. H. Bartley, Brooklyn.
104 Glaucoma from Operative Standpoint. P. A. Callan, New York.
105 Causes and Treatment of Chronic Conjunctival Affections in Childhood. A. W. Williams, New York.
106 Management of Abnormal Obstetric Cases. W. T. Getman, Buffalo.

99. Abstracted in THE JOURNAL, June 6, 1914, p. 1839.

101. **Care of Abdomen in Childhood.**—An infant under 6 months of age, according to Mosher, should not find out that there is any posture of the body other than the horizontal, and his acquaintance with the out-of-door world would be better made from a basket on a balcony, fire-escape, or even window (safely caged), than from a bumping baby carriage. When the abdomen is sufficiently developed to safely permit the sitting posture, and the child shows an interest in things around him, some modification of the "go-cart," supplied with proper springs and a seat on which a child can balance easily, is better than the present baby carriage into the soft cushions of which he sinks, losing and gaining his equilibrium as his flexible little spine wobbles hither and yon. Habitual physical quiescence with little mental entertainment not only makes happy babies, but tends to keep them normal. Little is needed for the development of the abdominal wall at this time, outside of perfect freedom of motion during waking hours. Petticoats, pinning blankets, and diapers should be so loosely fastened that they cannot interfere with the movements so important to a baby's digestive apparatus.

Mosher emphasizes that it is of great importance that infants shall early learn to lie on the abdomen as easily as on the back: no one position, however, should be permitted to become habitual. From the time a child has learned to walk easily, there is little danger of abdominal injury until school life begins. His play instinct keeps him constantly changing his posture and varying his movements. There are a few kinds of play, however, that may prove injurious. Those which encourage the sitting posture on the floor are not desirable nor are those which demand a stooping posture.

Many of the garments for children of school age are so shaped that they tend to produce round shoulders and flat chests with their accompanying encroachment on the abdomen. The American Posture League is taking up the subject of children's garments, and has already perfected a model known as the "Good Posture Suit," for boys, which carries the American Posture League label. Gymnastic exercise with especial reference to the development of the chest and abdomen is of great importance during the school life of children.

102. **Fractures of Neck of Femur.**—The following procedure is employed by Walker: A careful examination is made of the patient's condition in order to determine the wisdom of giving an anesthetic for a period of twenty minutes, this time being required for the application of the plaster bandage. As soon as the anesthetic permits complete relaxation, a gentle examination is made of the fracture and frequently crepitus is found in those patients in whom impaction is thought to be present.

The patient is lifted to a pelvic support, preferably furnished with a perineal bar for counter pressure, the extended limbs being supported by assistants. The assistant holding the uninjured limb abducts it to the normal limit in order that it may serve as a guide, and incidentally to fix the pelvis. The injured limb is first flexed and rotated sufficiently to disengage soft parts that may be interposed between the fragments. It is then completely extended, and the assistant, by direct manual traction, overcomes the shortening, as demonstrated by measurement and by the relation of the trochanter to Nélaton's line, at the same time correcting the outward rotation. Still maintaining steady traction, he then adducts the limb to correspond with its fellow, the operator meanwhile supporting the joint and lifting the thigh upward. The pelvis should now be level and the extended limbs in exact correspondence in every particular. A plaster spica is then applied from the axilla to the toes. This should be carefully adjusted about the pelvis and trochanter. It should completely cover the buttock and be heavily reinforced beneath the joint and thigh, that it may be unyielding to pressure and therefore effective as a posterior splint to hold the limb at its proper plane.

The prolonged plaster bandage maintains complete immobilization during the period of repair, overcoming the shortening and adduction. The adduction prolonged during four to six weeks is of marked importance in aiding the future ability to walk without impairment or limitation of motion. It further protects the patient from much unnecessary suffering on movement, and renders him far more comfortable.

Northwest Medicine, Seattle, Washington

December, VI, No. 12, pp. 359-392

107 Modern Medicine and Its Social Responsibilities. F. R. Green, Chicago. (To be concluded).
108 Physician and Public Health. E. R. Kelley, Seattle.
109 Political and Economic Aspects of Municipal Sanitation. J. S. McBride, Seattle.
110 *Causation and Prevention of Goiter. J. R. Brown, Tacoma.
111 *Prevalence and Distribution of Goiter in Washington, D. C. Hall, Seattle.
112 Treatment of Goiter. T. M. Joyce, Portland, Ore.
113 Medical Treatment of Goiter. C. W. Sharples, Seattle.
114 H. F. Eppley, Spokane.

110. **Causation and Prevention of Goiter.**—Reasoning from an abundant clinical experience, it seems reasonable to Brown to suppose that the infective agent or exciting material that causes enlargement of the thyroid gland does not act directly on the gland, but affects the system in such a manner that the gland must hypertrophy or enlarge to satisfy the demand for its peculiar internal secretion. He is convinced that, when the thyroid begins to enlarge there is a state of deficiency of thyroid secretion—hypothyroidism. Thyroid feeding improves the health and reduces in a very marked manner the size of the gland. The prevention of goiter would then resolve itself to purification of domestic water supplies by installation of hypochlorite plants and, perhaps, addition of iodin in minute doses to water for household consumption in goitrous communities. Focal infections of teeth, tonsils, adenoids and sinuses of head should receive prompt and careful treatment, especially in the young. Brown urges that careful search be made for hypothyroidism in the children, as thyroid feeding, if instituted in time, would probably prevent any marked hypertrophy of the thyroid.

111. **Prevalence and Distribution of Goiter in Washington.**—Hall attempted to classify the 3,339 students who entered the University of Washington during the past five years, according to the condition of their thyroid glands. This series consists of 2,086 men with the average age of 20 years and 5 months, and 1,253 women with the average of 19 years and 3 months. Of the 1,253 women, 388 were affected, or practically 31 per cent., as follows: 272 classed as perceptible, or 13.03 per cent.; 92 classed as medium or 4.43 per cent.; 10 classed as large, or 0.48 per cent. Of the 1,253, 388 were affected, or practically 31 per cent., as follows: 294 classed as perceptible, or 23.45 per cent.; 85 classed as medium, or 6.79 per cent.; 9 classed as large, or 0.7 per cent. Averaging men and women together it gives 24.40 per cent., or about one in every four.

Of the nineteen classed as large, four had a marked exophthalmus, one man and three women. In a series of 343 women, of whom 83 were affected, ten, or 2.9 per cent., gave a history of the malady in the family. As to the distribution of the malady, it bears a rather constant relationship to certain geologic conditions. From the standpoint of the soil in the state of Washington, it seems to be confined to that part in which the marine deposits of the eocene and myocene ages are still exposed, namely, all of the state excepting the southeastern corner consisting of the nine contiguous counties. From these nine counties eighty-two examinations were made with only three cases affected, or a percentage of 3.6. The soil of this area is alkaline, but the most interesting fact is that this entire area is covered with volcanic ash and lava. Thus the original surface is covered with a sterile mantle.

Old Dominion Journal of Medicine and Surgery, Richmond, Va.

December, XIX, No. 6, pp. 235-288

115 Nerve Injuries Due to Bony Abnormalities. F. M. Hanes, Richmond.
116 Midwife Problem in Virginia. W. A. Plecker, Richmond.
117 Action of Spartein. G. E. Pettey, Memphis, Tenn.

Ophthalmic Record, Chicago

December, XXIII, No. 12, pp. 595-648

118 New Operative Procedures for Shortening and Lengthening Muscles. R. O'Connor, Oakland, Cal.
119 Use of Invisible Bifocals in Treatment of Convergent Strabismus (Esotropia) in Little Children. W. Reber, Philadelphia.
120 Operation for Squint. C. Worth, England.
121 Insufficiency of Convergence: Its Diagnosis and Treatment. E. Landolt, Paris.
122 Extra-Ocular Tendon Lengthening and Shortening Operations which Enable Operator to Regulate the Effect. F. C. Todd, Minneapolis.

Pennsylvania Medical Journal, Athens

December, XVIII, No. 3, pp. 171-250

123 Significance of Increased Tension of Eyeball. S. D. Risley, Philadelphia.
124 Present Status of Our Knowledge of Shock. J. M. Wainwright, Scranton.
125 *Present Place of Vaginal Hysterectomy in Pelvic Disorders. Fifty Consecutive Cases. G. E. Shoemaker, Philadelphia.
126 Experimental Work on Relation of Iron and Iron Metabolism to Anemia. J. H. Austin, Philadelphia.
127 Correction of Abnormal Blood-Pressure. A. B. Hirsh, Philadelphia.
128 Are We Exaggerating Dangers of High Arterial Pressure? D. Riesman, Philadelphia.
129 Heart in Acute Infections. R. N. Willson, Philadelphia.
130 Ductless Gland Irregularities in Backward Children. E. B. McCready, Pittsburgh.
131 Renal Surgery. W. D. Hamilton, Columbus.
132 Light in Industries. E. Jackson, Denver.

125. **Vaginal Hysterectomy in Pelvic Disorders.**—With a very few exceptions of combined operation the only patients now recollected by Shoemaker who have lived and remained well ten to eighteen years after operation for undoubted malignant disease of the uterus, have been a few private patients who have had vaginal hysterectomy, preceded by the thorough use of the actual cautery, and supplemented by such use of hysterectomy clamps as has resulted in necrosis and discharge of much parametrial tissue during convalescence. The longest done was in February, 1896, or eighteen years ago, and the patient is still in good health. The pathologic diagnosis of carcinoma was made by Dr. Henry Cattell. Another patient aged 50, with squamous epithelioma of cervix, pathologic diagnosis made by Dr. Edsall, was operated on in 1898. Examined fourteen years later, she was well. One patient, aged 72 years, with epithelioma of cervix, lived ten years longer and died of old age without signs of recurrence. Another, with carcinoma of endometrium operated on fourteen years ago, is now well, her physician reports. Another was operated on twelve years ago and is now in perfect health. Pathologic diagnosis made by Dr. Beyea, was malignant adenoma of endometrium. Shoemaker states that these patients were seen very early and were cauterized, or they would not have done so well.

Public Health Journal, Toronto

December, V, No. 12, pp. 707-751

133 Use of Fermentation Test in Milk Examination. J. Race, Ottawa.
134 Medical Inspection of Schools in Edmonton, Alberta. T. H. Whitelaw, Edmonton.
135 How Can Average Old Stable Be Most Cheaply Fitted for Production of Clean Milk? J. B. Hollingsworth, Ottawa.
136 Nerve Block, Public Health and Tuberculosis. J. Grant, Ottawa.
137 Principles of Criminal Anthropology. A. MacDonald, Washington, D. C.

South Carolina Medical Association Journal, Seneca

September, X, No. 9, pp. 636-666

138 Rabies Situation in South Carolina. F. A. Coward, Columbia.
139 Relation of Domestic Water Supplies to Disease. F. L. Parker, Charleston.
140 Etiology of Pellagra. A. E. Vipond, Montreal, Canada.

October, No. 10, pp. 667-698

141 Spartanburg's Appreciation of Pellagra Commission's Work. J. J. Lindsay, Spartanburg.
142 Internal Secretions—Promising Field in Therapeutics and Diagnosis. G. F. Klugh, Cross Hill.
143 Additional Experiments with Salvarsan and Neosalvarsan in Treatment of Tuberculosis. T. Maddox, Union.
144 Caloric Feeding in Infancy. R. M. Pollitzer, Charleston.
145 Case of Internal Hydrocephalus with Specimen. G. T. Tyler, Greenville.

November, No. 11, pp. 699-731

146 Child and Sanitation in South Carolina. F. D. Rogers.
147 Abuse of Cathartics in Acute Abdominal Conditions. G. H. Bunch, Columbia.
148 Contagion and Disinfection. W. Egleston, Hartsville.
149 Intraspinous Administration of Salvarsanized Blood Serum. W. R. Barron, Columbia.
150 Cancer of Breast. A. E. Baker, Charleston.

Tennessee State Medical Association, Nashville

October, VII, No. 6, pp. 227-270

151 Antityphoid Vaccination in Children. W. Litterer, Nashville.
152 Present Status of Blood-Pressure. F. A. Jones, Memphis.
153 Treatment of Eclampsia. J. M. Trout, Knoxville.
154 Elliott Trephining Operation in Surgical Treatment of Glaucoma. H. Wood, Nashville.
155 Work of State Board of Medical Examiners. A. McCoy, Jackson.
156 Means of Resuscitation for Alarming Conditions Brought About by Anesthetic Agents. E. M. Sanders, Nashville.

FOREIGN

Titles marked with an asterisk (*) are abstracted below. Single case reports and trials of new drugs are usually omitted.

Dublin Journal of Medical Science

December, III, No. 516, pp. 401-478

1 Diligence and Professional Success. F. C. Dwyer.
2 Threshold of Disease. J. A. Lindsay.
3 Therapeutic Value of Pituitary Extract. C. O'Brien.

Edinburg Medical Journal

December, XIII, No. 6, pp. 441-519

4 *Primary New Growths of Mediastinum. J. N. M. Ross.
5 Perforated Gastric Ulcer. C. W. Cathcart, A. Thomson, H. J. Stiles and Others.
6 Nutritive Diseases of Infancy. J. S. Fowler.

4. **Primary New Growths of Mediastinum.**—Sixty cases were studied by Ross, 85 per cent. were found in persons over the age of 30 years and 70 per cent. between the ages of 30 and 50 years. The extremes were 18 and 70 years. Men were affected much more frequently than women, the proportion being 2.15:1. The sex, however, seemed to have a determinating factor as to the variety of tumor found. While in both sexes sarcoma was the commonest form, in females carcinoma was three times as frequently met with as in males. Males: Carcinoma, 4 cases; sarcoma, 33 cases; unclassified, 4 cases. Females: Carcinoma, 6 cases; sarcoma, 11 cases; unclassified, 2 cases. Only 23.5 per cent. gave a definite malignant family history, while in 31.6 per cent. there was a definite tuberculous family history. In 6.6 per cent. there was both a malignant and a tuberculous history. In 41.6 per cent. definite post-mortem evidence of tuberculosis was found within the chest, but in only two cases were tubercle bacilli actually demonstrated in the sputum.

The common seat of origin was the anterior mediastinum. In 68 per cent. of cases the anterior glands were primarily affected, though in 21 of these the disease had spread to involve the posterior and bronchial glands as well. Of the 44 cases of sarcoma 32 were lymphosarcoma. In 93.3 per cent. of cases the disease spread before death to involve the lung tissue. The right lung was affected in 71.6 per cent. of cases. The commonest combination was found to be an involvement of liver, pancreas and suprarenals. Most of the cases ran a more or less chronic course, and all were fatal. The minimum duration was nine weeks. The maximum duration was eighty-eight weeks. The tendency seemed to be that the younger the patient the more rapid was the course of the illness. The causes of death were: Exhaustion, 43 cases; asphyxia, 11 cases; hemoptysis, 3 cases; cardiac failure, 2 cases; cerebral tumor, 1 case.

The study of these 60 cases of new growth of the mediastinum leads Ross to conclude that malignant disease of the mediastinum is not so rare as is generally supposed, and it seems to be increasing in frequency. The symptomatology is variable. If pyrexia be present, it is due to some complication supervening on, or caused by, the original condition. Microscopic examination of the sputum is rarely of any diagnostic value, but the persistent absence of tubercle bacilli in a case suggesting pulmonary tuberculosis is very significant. Hemoptysis, though moderately common, is rarely severe. A pleural effusion is often present and it is often hemorrhagic, but a hemorrhagic effusion is not pathognomonic of malignant disease. Microscopic examination of the pleural fluid is rarely of any diagnostic significance. A large proportion of lymphocytes is quite as commonly found in a malignant as in a tuberculous effusion. Roentgenography is of great value in the diagnosis.

Lancet, London

December 19, II, No. 4764, pp. 1397-1450

7 *Modern Aspects of Certain Problems in Pathology of Mental Disorders. E. Goodall.
8 *Method of Treating Sac in Radical Cure of Femoral Hernia. J. P. Buckley.
9 *Treatment for Prolapsus Ani in Young Children. W. Gemmill.
10 Case of Delayed Chloroform Poisoning. H. P. Fairlie.
11 Case of Acromegaly Two Hundred Years Ago. L. Mark.
12 Trigger Finger, Its Cause and Mechanism. A. B. Judson.
13 Treatment of Wounds in War. A. A. Bowlby.
14 Our Army's Teeth. F. Newland-Pedley.

7. **Modern Aspects of Certain Problems in Pathology of Mental Disorders.**—In the absence of anything approaching adequate information, it seemed desirable to experiment with the blood of certain of the insane with a view to determining whether specific precipitins could be produced by inoculation of rabbits and for this purpose Schölberg and Goodall selected cases of dementia paralytica and dementia praecox; the former presenting well-marked symptoms of the second stage, the latter in an active stage of the disease. Blood was received from an arm vein through a sterile cannula into a sterile bottle, and the serum allowed to separate. Rabbits were inoculated intravenously, in accordance with the practice recommended by Uhlenhuth and Weidanz, at intervals of seven days with from 2.5 to 3.0 c.c. of the serum. Seven days after the third injection and before each subsequent injection, about 3.0 c.c. of blood was removed from the dorsal vein of the ear, centrifugalized, and 0.1 c.c. of the serum added to 1 c.c. of a dilution of 1 in 1,000 (salt solution) of the freshly obtained serum of the patient whose blood was to be tested. The antiserum was thus tested on the seventh day after each injection—that is, about the time at which, according to Uhlenhuth and Beumer, the production of precipitin in the rabbit's blood is most active.

Schölberg and Goodall found that when a precipitate was about to be formed the clear fluid of the tube concerned showed a characteristic cloudiness within a quarter of an hour, but flocculi took longer to appear; and it was from one to three and a half hours before the actual precipitate was apparent. The animal furnishing the precipitin was immediately killed under chloroform, the blood allowed to collect and clot in a sterile bottle, the serum filtered through a porcelain filter and received direct into ampoules, which were sealed as filled. Thirteen patients were examined and ninety-four rabbits were used. Precipitin was formed in 10.6 per cent. or in ten out of the ninety-four instances, illustrating the difficulty met with in the attempt to obtain information about precipitins. A precipitin was mostly obtained after injection of from 8 to 12.5 c.c. of serum, and when the latter amount is exceeded the prospect of obtaining precipitin is small; in fact, it is not worth while to continue with the injections when no result is obtained with, say, 15 c.c. The loss of weight shown in individual instances was very considerable in the majority of the rabbits, and of 89 in which the weight was taken weekly during the inoculations, 73, or 82 per cent., lost weight.

The points brought out are these: Seven antiserums, from rabbits inoculated with serum from cases of dementia paralytica and dementia praecox were employed against the serum of 173 patients, in dilutions varying from 1 to 100 and 1 to 20,000. These patients illustrated many kinds of insanity—two exceptional cases were those of sane persons with florid syphilis, for trial with antiserum from a general paralytic. Each antiserum was put against the serum of the patient by the injection of which it resulted, also against that of patients with the same disease, and against serum of patients with other kinds of insanity.

The results were estimated by naked-eye observation. From these it is to be gathered that a given antiserum produces the same amount of precipitate, whether it be put against the actual serum by which it was produced, the serum of patients suffering from the same disease, or the serum of patients suffering from other kinds of insanity. And this obtains for the various dilutions employed. In ten cases antiserum from a general paralytic was put against cerebrospinal fluid from general paralytics, an imbecile, and a case of delusional insanity, in a dilution of 1 to 500. Either no precipitate or a mere trace resulted and without distinction as regards amount. With the pure cerebrospinal fluid, abundant precipitate resulted, but again without distinction. Evidently the reacting body is much less in amount in this fluid than in the serum.

8. **Radical Cure of Femoral Hernia.**—During the last three years Buckley has performed the following operation some thirty times, no patient having returned with a recurrence. The skin incision is made commencing about 1½ inches

above the inner end of Poupart's ligament and vertically above the crural canal, extending down to 1½ inches below the external opening of the canal and having a slight convexity outward. Buckley prefers the external convexity in that it gives more room and removes the suture line further from the genital organs than does the ordinary straight vertical incision. The hernial sac, covered by its layer of properitoneal fat, is exposed and thoroughly separated as far as the opening of the crural canal into the thigh. The upper end of the wound is held open by retractors, the surface of the aponeurosis of the external oblique muscle cleaned and an incision made in it parallel to its fibers about 2 inches long and ½ inch above the external ring of the inguinal canal. The conjoined tendon is thereby exposed. The properitoneal fat, covering the true sac of the hernia, is now removed as completely as possible.

An opening is made with scissors at the apex of the sac, the contents, if any, are reduced, and any adhesions separated. The edges of the sac are held apart by Spencer Wells forceps, and the forefinger is passed through the crural canal into the abdominal cavity. The finger when passed is flexed forward so that the tip presses against the conjoined tendon. A pair of closed curved "catch" forceps is passed along the flexor surface of the inserted finger until the tip of the forceps is against the conjoined tendon; the tip of the forceps is pushed through the conjoined tendon, and appears at the upper end of the skin incision. The opposed surfaces of the blades of the forceps are grooved, the better to hold a closed pair of Kocher's hernia forceps, the tips of whose blades are inserted between the blades of the curved forceps. The latter are withdrawn with the Kocher forceps in their grip, so that the blades of the latter forceps appear at the opening at the apex of the hernial sac.

The edges of the sac are caught between the blades of the Kocher forceps and the sac is pulled inside out, appearing through the conjoined tendon. This maneuver is carried out gently but firmly, and the peritoneal lining of the crural canal is stripped completely away from the canal and invaginated together with the sac of the hernia. The sac is transfixed with a full-curved needle, threaded with catgut, close to the conjoined tendon, ligatured and then cut away. One end of the catgut is again threaded and the needle passed through the conjoined tendon on one side of the stump, through the stump itself and through the tendon on the other side of the stump, and the two ends tied, the stump thereby being fixed to the conjoined tendon and retraction being prevented. The slit in the aponeurosis of the external oblique muscle is closed with a continuous catgut suture; the pectineus muscle and fascia are brought into apposition with Poupart's ligament by a stout catgut suture; the skin incision is closed with silkworm gut, and a gauze dressing and firm spica bandage applied.

9. **Treatment for Prolapsus Ani in Young Children.**—The principle in the treatment advocated by Gemmill is to bring about a condition in which the abdominal capacity responds passively to the decrease in contents brought about by the evacuating contractions of the large bowel, and is not actively decreased by the strength of the accessory forces. This is attained by preventing the flexion of the thighs and spine. A straight wooden splint, well padded and covered with mackintosh, is applied to the back of the child of a length to reach from the neck to the heels, and the child is fixed to the splint by two bandages, one round the thorax and the other round the lower limbs. Splint with a hiatus in the region of the anus bridged by a circle of iron, allows defecation without soiling of the splint and also easy access for such local treatment as cold douching. The result obtained is that the extended position of the child prevents the action of the accessory forces in great part, for the abdominal muscles are placed at a disadvantage for contracting. This position also prevents the decrease in abdominal capacity from flexion. Hence evacuation takes place almost entirely from the muscular action of the great bowel. The removal also of the natural support which the soft parts give to the anal canal and sphincters is prevented, and the splint itself gives additional local support by pressing on the soft parts of the buttocks, from which it follows that the hiatus must not be too large, a condition in which this local pressure would be lost. The relief which this method gives is immediate, the bowel remaining in the abdomen after reduction from the beginning and no prolapse occurring even during defecation, for which the splint must not be removed.

Bulletin de l'Académie de Médecine, Paris

November 24, LXXII, No. 37, pp. 269-292

15 *Treatment of Wounds in War. Chavasse.
16 Treatment of Wounds of the Eyes. (Blessures de l'œil.) A. Terson.
17 Pointed Tip of Bullet Turned Backward in Cartridge. (Une explication possible de certains blessures graves par balles de fusil.) T. Tuffier.

December 1, No. 38, pp. 293-316

18 *Phenol in Treatment of Tetanus. P. Sainton.

15. **Treatment of Wounds in War.**—This is a little manual of instructions for the physicians with the French army, prepared by Chavasse, chief of the medical department of the active army. It says that every wound and its vicinity should be painted with a single coat of 1 per cent. tincture of iodin. Soiled dressings must not be thrown on the floor, but into some receptacle. The fact that a dressing smells badly is in itself no reason for changing it. Nothing promotes the healing of a wound so much as to leave it in peace. When the dressings smell offensively they can be deodorized with a tablespoonful of Javelle water (solution of chlorinated potassa) to a liter of water, or a tablespoonful of Labarraque's solution (solution of chlorinated soda) to a liter of water. Trains carrying the wounded should have an ample supply of these deodorants. Another point emphasized is that bandages should not be made up in rooms where there are sick or wounded. Wounds in war should never be closed up, but, when the defect is very large, strips of plaster, clips or other measures partially to close the gap will aid repair later. No constricting band should be left in place for longer than one hour or two at most. Direct compression to arrest hemorrhage is safer than letting a tourniquet stay on too long. Jagged wounds should be cautiously cleared of foreign substances and sterilized with hydrogen dioxid, finishing with tincture of iodin applied throughout the depths to every point. Pure oxygen played in the depths of the wound is an important aid in warding off gas gangrene.

18. **Phenol in Tetanus.**—Sainton says that six patients recovered of his twenty-two with tetanus, and in two the tetanus was of the severest type. His treatment consisted of a subcutaneous injection twice a day of 40 or 50 c.c. of 2 per cent. solution of phenol—the Baccelli method. The patients were isolated in semidarkness, and twice a day each was given an enema containing 6 or 8 gm. of chloral, one or two yolks of eggs and 250 gm. of milk. The phenol injections were kept up for a month or more in two cases, one patient thus receiving a total of 48 and another 88 gm. of the phenol (*acide phénique*). The secret of success, he reiterates, is to commence treatment at the first signs of the slightest difficulty in swallowing or of contracture in the muscles around the wound.

Presse Médicale, Paris

November 12, XXII, No. 75, pp. 673-680

19 Metal Brace for Extension in Fracture of the Humerus. (L'appareil à extension du Pr. Pierre Delbet.) A. Mossé and Lemare.
20 Gas Gangrene and Injury from Freezing. (Gangrènes gazeuses et engelures.) G. P. Trifonoff.

November 26, No. 77, pp. 697-704

21 Vaccination against Typhoid in Belfort District. H. Bousquet.

Revue Médicale de la Suisse Romande, Geneva

November, XXXIV, No. 11, pp. 617-696

22 *Abdominal Fixation of Retroflexed Uterus and Subsequent Pregnancy; Thirty-Eight Cases. (Hystéropexie abdominale directe et puerperalité.) M. Muret.
23 *The Swiss Red Cross Unit in Balkan War. (L'activité de l'ambulance Vaud-Genève pendant la guerre gréco-turque.) A. Reverdin.
24 *Prevalence of Cancer in Switzerland in Relation to Soil and Water. J. Barth.

22. **Correction of Retroflexion by Abdominal Fixation of the Uterus.**—Muret analyzes with minute detail 38 cases of this kind in which pregnancy occurred later. The women were between 21 and 35 years old, and the pregnancy developed normally and the head presented in every case. Delivery was spontaneous in 23 of the 31 cases that proceeded to term; forceps were required in 8 and there was premature delivery in 3 cases and 7 of the women aborted. There was never any disturbance from traction on the uterus or displacement of the cervix or abnormal presentation or dystocia requiring version or cesarean section, and the puerperium was normal in all. He fastens the uterus to the abdominal wall very low down on both the uterus and the abdominal wall, and makes the junction superficial and narrow. This allows the uterus to expand without interference with its enlargement or its evacuation later. The proportion of premature deliveries and abortions was no higher than the usual average, he adds.

23. **Work in Field Hospital in Balkan Wars.**—Reverdin's account of the work of the flying hospital sent by Switzerland to the aid of Greece in 1913 is profusely illustrated. The mortality among the wounded rose and fell with the duration and discomfort of the transportation. He says that bullets that rebound from a hard surface are liable to have the shell cracked and thus they mushroom in the tissues. Another factor in explosive action of this kind is the heat generated by the impact against the hard substance; the bullet as it rebounds has become so hot that part of the lead kernel softens. The great difference in favor of abdominal wounds in war, he remarks, "is because the soldiers are not the sedentary, meat-eating, constipated creatures of peace." One of the drawbacks of military surgery is that the wounded pass through two or three different surgeons' hands in the field and clearing and base hospitals, and the plan of treatment thus gets deflected according to the personal bias of each surgeon.

24. **Cancer in Relation to Soil and Water.**—Barth's geologic and meteorologic data and the statistics in regard to the prevalence of cancer show that in the regions with much silica in the soil cancer is comparatively rare. It is twice as frequent in the regions with chalky soil, and especially along the rivers flowing through cretaceous regions. He urges others to investigate the data along these lines in other countries, and adds that Zeller has reported encouraging results from sodium silicate in treatment. Phenomena of mineralization or demineralization from the action of the lime in the cretaceous soil may yet prove to be a factor in the predisposition to cancer.

Archiv für klinische Chirurgie, Berlin

CVI, No. 1, pp. 1-250. Last indexed Dec. 5, p. 2077

25 *Thyroid and Parathyroid Grafts. (Zur Frage der dauernden Einheilung verpflanzter Schilddrüsen und Nebenschilddrusen, zugleich ein Beitrag zur postoperativen Tetania parathyreopriva.) A. von Eiselsberg.
26 *Thyroid Grafting. (Schilddrüsentransplantation.) E. Payr.
27 Surgery of Intrathoracal Cancer of the Esophagus. E. Unger.
28 Surgery of the Sinus Cavernosus. E. Streissler.
29 Radium and Roentgen Treatment of Cancer. A. von Eiselsberg.
30 Injury from Indelible Pencil; Three Cases. (Verletzungen mit Tintenstiften.) S. Erdheim.
31 *Absorbable Tampons to Arrest Sheet Hemorrhage. (Neue Methode zur Stillung parenchymatoser Blutungen.) E. Jeger and J. Wohlgemuth.
32 The Electromagnet in Prophylaxis of Abdominal Adhesions. (Ueber den Magen Darm- Elektromagneten und seine Anwendung. Prinzipien der Adhäsionsprophylaxie.) E. Payr.
33 *Experimental and Clinical Study of the Thymus Gland. O. Nordmann.
34 Influence of Splenectomy on Blood-Picture. (Experimentelle Untersuchungen über den Einfluss der Milzexstirpation auf das periphere Blutbild.) E. W. Kreuter.
35 Overlapping of the Abdominal Walls in Hernia Operations. W. v. Wrzesniowski.
36 Non-Malignant Epitheliomas. (Zur Lehre von den gutartigen Hautepitheliomen.) L. Wrede.
37 Phlegmonous Intestinal Processes. G. von Saar.
38 Treatment of Stiff Joints. (Weitere Erfahrungen über die Mobilisierung ankylosierter Gelenke.) E. Payr.

25. **Thyroid and Parathyroid Grafts.**—Von Eiselsberg's experience has been disappointing, like those of others in this line. The implanted gland tissue sooner or later becomes absorbed. But there was unmistakable benefit at first in some cases, and this might tide the patient along until the natural gland had recuperated enough to resume its functioning. The benefit at first may be marked, but then it soon dies out, contrary to what occurs with thyroid treatment; here the benefit develops very slowly and gradually. He describes in detail his 2 cases of repeated thyroid grafting in cretin children, and also 4 cases of repeated grafting of parathyroids in adults for postoperative tetany. Two patients were cured and transient improvement was evident in the others. In connection with the above grafting experiments, he reviews the 22 cases of postoperative tetany that have developed in the last twelve years among his 1,300 operations on the thyroid. In 14 cases the tetany was mild and transient; in 4 it persisted for several years, nine months or six weeks, and in a fifth case it was extremely severe, but subsided after parathyroid grafting. In 3 other cases the patients succumbed to pneumonia not long after the operation, and the severe tetany had persisted during the interval. In 2 cases of long persisting tetany, cataract developed during its course. In some of the cases the postoperative tetany can be explained only on the assumption that the patients did not have the normal number of parathyroids at the time of the operation. Parathyroid grafting is not always feasible, as the donors can seldom spare enough parathyroid tissue for the purpose. Consequently, Eiselsberg advises waiting until parathyroids can be obtained from a child dying at birth or from a fatal accident. His one attempt to use a parathyroid from a monkey proved a failure.

26. **Thyroid Grafts.**—Payr has done seven transplanting operations on the thyroid in the last eight years. In five cases the interval since has been over three years. He thinks that the improvement in the myxedema which followed the grafting is to be ascribed to the implant, and justifies further work in this line even if the implant does finally become absorbed. Certain important conclusions can be drawn from his experience, namely, the necessity for distinguishing between congenital thyroid insufficiency and acquired insufficiency. Children born without a thyroid do not survive puberty, while cretins with a goiter may live to an advanced age. Signs of defective development of all or part of the brain render the outlook for treatment less promising. Zingerle and Scholz found decided pathologic changes in the brains of cretins, asymmetry of the hemispheres, unusually small size of certain lobes, abnormal convolutions or entire absence of convolutions in the frontal lobe, and abnormally large ventricles. These characteristic findings readily explain the inefficacy of any treatment.

Payr is convinced that the thyroid plays an important part in the development of the central nervous system; the earlier the thyroid loses its physiologic balance, the more serious the resulting influence on the development of the nervous system. The clinical forms of imbecility must be studied more closely so as to differentiate those in which thyroid functioning is at fault from the cases of mental impairment from encephalitis, hydrocephalus, syphilis, rachitis, steeple skull, etc. With acquired thyroid insufficiency we can hope for some relics of normal thyroid tissue. Thyroid treatment must be given a thorough trial before any grafting operation of the kind. If there is not the slightest benefit after a thorough parenteral course of thyroid treatment, the thyroid origin of the trouble is open to doubt.

In case of doubt he advises a small exploratory incision to expose the thyroid and show its actual condition. This is a very simple and harmless procedure even for small children, and the incision can be utilized to implant thyroid tissue at the same time. It might be advisable to make an incision at the root of the tongue in case there is suspicion of an aberrant thyroid here. Blood relations seem to be better for donors, and as so much of the graft is promptly absorbed it is wise to make it quite large. When the implant is in a serous cavity or organ, fitting tight and snug against the tissues, the conditions for nourishment may be better than when the reliance is on the sutured vessels. Thrombosis dooms the whole implant in the latter case. The marrow of

the tibia, the spleen and the subcutaneous cellular tissue are the best sites for the grafting operations. The latter permits repetition of the grafting with less damage than at other points.

31. **Absorbable Tampons to Arrest Parenchymatous Hemorrhage.**—Jeger and Wohlgemuth make a fibrous, lint-like mass out of a delicate membrane taken from the intestines of sheep or cattle. It is frozen in a solid mass and then cut into very thin slices which break up into extremely fine threads. It is sterilized by keeping for three days in a 5 per cent. solution of phenol and then rinsed well in alcohol. The soft fibrous mass is rinsed in salt solution before using and is applied still dripping to the bleeding surface. The capillary attraction of the fibers is equal to that of strips of gauze, and the broad stream of blood is thus changed into innumerable minute streams, thus multiplying the surface area—a powerful factor in the coagulation of blood. The fibrous mass is also pressed down on the bleeding surface like any tampon, but it is gradually absorbed. Not a trace of it could be seen after four or six weeks in the experiments on dogs' livers, spleens, etc., reported.

33. **The Thymus.**—Nordmann was unable to detect any influence on the growth or development in any way of dogs thymectomized soon after birth. His evidence is all against the assumption that the thymus is a vitally necessary organ. On the other hand, when the thymus is unduly enlarged and probably hyperfunctioning it is liable to set up or aggravate exophthalmic goiter. He operated on the thyroid for exophthalmic goiter in eighteen patients and three died during the operation, and in all of these—a man of 48 and two women of 28 and 23—the thymus was found unusually large for their age. The others were all cured by the operation on the thyroid. In some cases everything seems to incriminate the thymus as the cause of exophthalmic goiter. In any event the thymus should be investigated in every case, and if the thyroid seems practically normal while the symptoms are severe, the thymus is probably at fault. It should be resected if unduly large for the age. If not enlarged, the intervention had better be restricted to simple ligation of the vessels at the poles of the thyroid. If no improvement follows this in the course of months, resection of the thyroid should be advocated. When the exophthalmic goiter is of purely thymic origin, the patients seem to be unable to stand the simplest operative procedures, not even ligation of the vessels of the thyroid under local or general anesthesia. The operation in itself and the resulting shock seem to be the cause of death with persisting thymus, and yet one of the patients in his group with fatal outcome had passed through an operation for ruptured tubal pregnancy without harm two years before. It is possible that the operation on the thyroid causes the production of certain fatally poisonous substances. It is certainly noteworthy that some of these patients had had operations done on the thymus without harm; the thyroid had been left unmolested, however.

Berliner klinische Wochenschrift

November 30, LI, No. 48, pp. 1853-1880

39 *War Neurology. (Zur Kriegsneurologie.) H. Oppenheim.
40 Vaccination Against Typhoid. (Typhusschutzimpfung.) H. Kossel.
41 *Freezing Injuries. (Erfrierungen im Kriege und ihre Behandlung.) E. Melchior.
42 *Transfusion of Blood. (Ueber grosse Bluttransfusionen.) A. Plehn. Concluded in No. 49.

December 7, No. 49, pp. 1881-1904

43 Treatment of Gunshot Wounds. Stutzin.
44 Tetanus. G. Wolfsohn.
45 Anthrax as War Pestilence. (Der Milzbrand als Kriegsseuche.) P. Richter.
46 Treatment of Malaria in Fowls. (Chemotherapeutische Versuche bei Vogelmalaria.) L. H. Marks.
47 Direct Examination of Duodenal Contents (also Bile) as Aid in Diagnosis of Gall-Bladder and Pancreatic Affections. M. Einhorn (N. Y.).
48 *Nosebleed in Children. (Zur Kenntniss und Bedeutung des Nasenblutens im späteren Kindesalter.) A. Petry.

39. **War Neurology.**—Oppenheim is in charge of what he calls the Nerven-Lazarett at Berlin with 100 beds, exclusively for soldiers with nervous affections. Neuroses and psychoses are not so frequent among the troops as might be anticipated, and as a rule they develop only in the predisposed, either by previous nervous or mental affections, trauma affecting the head, or abuse of alcohol. The vasomotor sphere seems to be peculiarly affected in these war neuroses. The syndrome of exophthalmic goiter developed in one officer, but disappeared again after a six weeks' rest cure. Oppenheim has been impressed with the remarkable variety of the symptoms that may follow a gunshot wound of the head. The destruction caused by the bullet on its way is responsible for them, not the bullet itself, he thinks.

When a bullet hits the spine and swerves aside, the impact may cause hemorrhage in, softening or acute necrosis of the spinal cord, even with intact vertebrae. What to do in these cases is a problem. He operated in five, but learned nothing definite except possibly that signs of a total lesion of the cord do not contra-indicate operative measures unless of several months' standing.

The sensory nervous system participates to a remarkable extent in gunshot wounds of the peripheral nerves; sometimes the sensory fibers alone seem to be injured. The agonizing pains are relieved only transiently by morphin in large doses. These pains seem to occur only when the nerve is partially injured and not when the injury blocks the entire nerve, as a rule. He has had several cases in which the bullet had injured the sensory fibers and no others in the sciatic nerve. There was anesthesia of the sole, while the motor functioning and electric excitability were normal. These experiences confirm Stoffel's views on treatment of spastic paralysis.

The psychic and remote vasomotor and secretory phenomena in some cases suggest that the impact of the projectile caused a wave of molecular changes in the various parts of the central nervous system. The terrific neuritic pains were sometimes relieved by a hot bath or superheated air or a plaster dressing. The pains usually become attenuated in time, but this may require months.

41. **Freezing Injuries.**—Actual freezing requires rubbing with snow or cold cloths and then wrapping in cotton to allow the limbs to warm up in bed without artificial heat. The same is advisable also when there has not been actual freezing. To emphasize the danger from artificial heat, even when the parts are not actually frozen, Melchior reports the case of a robust young man who had been out with snow shoes in extreme cold and danced in the evening. On the homeward trip he put his cold feet on the stove in the car, and rapid gangrene followed with sloughing of all the toes. When gangrene threatens, the stasis may be arrested by slitting the end of the finger or toe down to the bone, as Noesske has recommended (described in THE JOURNAL, 1909, liii, 1605). This measure rendered good service during the recent Balkan wars. When gangrene has developed, the drying up of the tissue can be hastened by peeling off the epidermis. The benefit from this is especially apparent when the epidermis has been partly removed and patches of it left. The mummification and healing of the bare areas proceed much more rapidly than elsewhere, as the epidermis acts like an impermeable membrane damming up the secretions, the sweat glands, etc., having lost their functional capacity in the gangrenous region.

42. **Transfusion of Blood.**—Plehn says that during the seventeenth century attempts were made to tranquilize persons with rabies and insane persons by transfusion of the blood of the gentle lamb. Denis and Tardy used a silver catheter for the purpose, but owing to the disapproval of the Paris medical faculty the procedure was abandoned until revived about 1820. Plehn took it up about six years ago and has applied it in thirty cases, mostly of pernicious anemia. The technic for keeping the blood at body heat until it enters the vein is still far from perfect. He found that it lost several degrees between the donor and the recipient in his cases. The primary symptoms as the blood begins to flow into the vein gradually become attenuated and there seldom are secondary symptoms unless 600 c.c. or more is transfused. With 200 or 250 c.c. he has had no secondary reaction. The symptoms are slight fever, head-

ache and prostration and possibly a chill. The donor's blood must show at least 95 or 80 per cent. hemoglobin. Plehn's results have been incomparably better since he has made a point of selecting persons with polycythemia for the donors.

Four of his patients were practically moribund and soon succumbed notwithstanding transient benefit from the transfusion. One of these was a woman almost exsanguinated from a bleeding myoma. When the blood was allowed to pour into the vein it seemed to meet with some hindrance; the transfusion was then changed to the other arm but the same hindrance to the inflow was encountered. This rendered it evident that the trouble was in the right heart itself, the degenerated muscle not being strong enough to manage with the extra supply of blood. Constriction was then applied to the vein below to retard the inflow, and with this modification the whole amount was infused, 550 c.c. of blood and 500 c.c. isotonic salt solution, the procedure taking nearly an hour. Toward the last there were nausea and chilliness and the temperature ran up to 40 C. but these soon subsided and the woman's condition was improved so much by the transfusion that three days later an attempt to remove the myoma could be made.

In a fifth case a robust man of 49 had had stomach disturbance for six months and then pernicious anemia developed in the course of a few weeks. When the hemoglobin had dropped from 25 to 23 in a week, 400 c.c. of blood from a young woman was infused plus 500 c.c. salt solution. Symptoms of intoxication followed, with death the nineteenth hour. The blood of the donor induced agglutination and hemolysis with blood from other patients, and the dead patient's urine contained hemoglobin. The extra mechanical task imposed on the heart renders extreme caution necessary during the infusion. Attacks of coughing are evidently due to the overfilling of the vessels in the lungs. They cease as the heart adapts itself to its task. The infused fluid must be kept at body temperature or there is liable to be trouble, but aside from this, if there is no tendency to hemolysis—and this can be excluded by preliminary tests—the secondary disturbances need not be feared. His experience with transfusion in cases of secondary anemia has been extremely gratifying, as also preliminary to operations in which considerable loss of blood is feared, with placenta praevia, extrauterine pregnancy, etc. As there does not seem to be any tendency to anaphylaxis with transfusion of blood, it can be repeated as often as needed. He has found it the best means to arrest subacute hemorrhages, and theorizes to explain the mechanism of its action in this and other respects, emphasizing in conclusion that the transfusion requires trained assistance.

48. **Nosebleed in Children.**—Petry relates the case of a child of 9 who for a year had suffered from recurring epistaxis and was extremely anemic. She had been treated with iron for the anemia but the nosebleed kept returning. Finally two minute ulcers were discovered on the septum, the source of the bleeding, and as soon as these had been cauterized with trichloracetic acid there was no further hemorrhage and the anemia rapidly gave place to normal conditions. During sepsis and acute infectious diseases, the diagnosis of "septic nosebleed" should never be made without inspection of the nose, as an overlooked bleeding ulceration may do great harm as he shows by a number of examples. In one case a child of 7 had pneumonia, fever, headache and vomiting, and by the end of the week he began to vomit large amounts of dark clotted blood and was much agitated. No one, not even the trained nurse, suspected that the blood came from the nose until a small bleeding ulcer was found on the septum and promptly healed under an epinephrin salve. In two other cases pneumonia set in with profuse epistaxis and necropsy in one case showed numerous emboli of diplostaphylococci in the capillaries of the nasal mucosa. The mucosa in the non-fatal case presented the same aspect. In a third case the profuse epistaxis came on likewise late in the course of pneumonia, and the nosebleed was followed by extravasation of blood into the skin at various points. The child had tossed around so much that the ecchymoses at various points were evidently of a traumatic nature, but the hemorrhages were none of them profuse enough to have proved fatal if it had not been for the continuous drain from the bleeding ulcer on both sides of the septum. It is more than probable, Petry adds, that the child might have been saved if the bleeding ulcers in the nose had been discovered earlier. The hemorrhages were ascribed to the sepsis in general and no search was made for a possible local source.

Deutsche medizinische Wochenschrift, Berlin

November 26, XL., No. 48, pp. 2001-2024

49 *Acute Injury of the Esophagus. (Behandlung akut bedrohlicher Zustände bei Erkrankungen der Speiseröhre.) J. Grober.
50 Necessity for Seeking Out Source of Venereal Infections. (Zur Prophylaxe der Geschlechtskrankheiten im Felde.) A. Buschke.
51 Sterile Catgut. W. Lange and Grenacher.
52 Gas Phlegmons. A. Tietze and Korbsch.
53 *Treatment of Furuncles. A. Schüle.

49. **Acute Injuries of the Esophagus.**—Grober discusses the treatment of caustic corrosion of the esophagus, foreign bodies, etc., and wounds of the esophagus in war. He warns against any attempt to remove foreign bodies by mechanical means except under direct visual inspection with endoscopy. Until this can be done the patient's pain and distress can be alleviated by sipping a solution of cocain, a drop or so at a time, keeping well under the maximal dose, or twenty drops of a 1 per cent. solution of morphine in a tablespoonful of water. The region should be examined with the endoscope also if the slightest disturbance is noted a few days after a foreign body in the esophagus has been expelled by vomiting or has been carried down and off through the stomach and intestines. Gunshot and bayonet wounds of the esophagus display a marked tendency to spontaneous healing. In one such case the man died a week later from a wound in the head received at the same time a bullet had severed about a third of the circumference of the esophagus; necropsy showed that the opening had healed without suppuration. The man had been given nothing by the mouth except ice water. With cancer in the esophagus, the physician's task is to inform the family but keep the patient from suspecting the nature of his trouble. Here more than anywhere else perhaps, he remarks, is the difference more evident between the true physician and the "for revenue only" type. In management of a diverticulum, relief can often be obtained from an emetic; he has one patient who for years has taken an emetic every morning and thus regularly clears out his diverticulum.

53. **Treatment of Furuncles.**—Schüle declares that every furuncle can be aborted in the first forty-eight hours if the center is burnt out under local anesthesia with 2 per cent. novocain injected first to make a blister and then injected perpendicularly into the center of the boil. The actual cautery can then be used to burn out the center or merely a knitting needle can be used, heated red hot in an alcohol flame. The knitting needle can be stuck through a cork for a handle. To prevent further furuncles developing the skin should be cleansed with soap, rubbed with alcohol and any suspicious looking points painted with tincture of iodin, burning out the center if a furuncle does develop. Even with a fully developed furuncle he advocates burning out the center plug in this way rather than to incise. The hyperemia thus induced aids in warding off new infection.

Deutsche Zeitschrift für Chirurgie, Leipzig

October, CXXXI, Nos. 5-6, pp. 397-598

54 *Plastic Operations on the Esophagus. A. Jianu.
55 *Diabetes and Surgery. H. Fischer.
56 Hemorrhoidal Nodules in the Newly Born. H. Harttung.
57 *Cystinuria and Cystin Concrements. L. Frankenthal.
58 Paranephritic Abscess; Thirty-Five Cases. W. V. Simon.
59 *Serodiagnosis of Cancer. (Die Abderhaldensche Reaktion beim Carcinom.) S. Trubina.
60 Chronic Duodenal Ulcer; Clinical Study of Operative Treatment. F. Kaspar.

54. **Plastic Operation on the Esophagus.**—Jianu has applied in two further cases his method of making a new esophagus out of a strip of tissue cut from the greater curvature of the stomach and brought up under the skin of the chest to form a tube opening into the stomach and serving as the gullet. These two cases show that the operation can be done success-

fully even on much debilitated children, and that the technic is comparatively simple and easy even when the stomach is adherent to the abdominal wall. He answers the various objections that have been made to the method.

55. **Diabetes and Surgery.**—Fischer reviews his experience with various operative measures for surgical affections in 86 diabetic patients. The total mortality was 48.8 per cent., but it was 54.5 per cent. in the 57 requiring operative treatment; and 72.7 per cent. in the 11 amputations for diabetic gangrene. In 8 of his 23 cases of diabetic carbuncle the diabetes was discovered first when the carbuncle developed.

57. **Cystinuria.**—In Frankenthal's two cases the output of cystin was reduced when meat was dropped from the diet but then there was almost constant pain. When meat was allowed, plus sodium bicarbonate, there was little cystin but still great pain, regardless of whether the patient was in bed or up and about. On a meat diet the amount of cystin crystals increased but the pain was less, the patients increased in weight and felt better. The first patient was a woman of 24 and a cystin stone was removed from her kidney pelvis. The other was a boy of 3 and the concrement causing the trouble was in the bladder. It cast a shadow and measured 3x2.3x1.6 cm.

59. **Serodiagnosis of Cancer.**—Trubina obtained a positive response to the Abderhalden test in 95 per cent. of 73 cancer cases, but 50 gave a positive response also with placenta tissue, and 13 of 19 pregnant women gave a positive response with cancer tissue.

Medizinische Klinik, Berlin

November 29, X, No. 48, pp. 1727-1754

61 *Syphilitic Abdominal Disease. (Die syphilitischen Erkrankungen der Bauch- und der Circulationsorgane und ihr Einfluss auf die Felddienstfähigkeit.) G. Hoppe-Seyler.
62 Localization of Foreign Bodies. (Behelfe zur Fremdkörperbestimmung.) Drüner.
63 Radiotherapy of Skin Diseases. (Die strahlenden Energien in der Dermaltherapie.) S. Ehrmann.
64 *Trauma and Pulmonary Tuberculosis. A. Mayer.

61. **Abdominal Syphilitic Affections.**—Hoppe-Seyler expatiates on the variety of clinical pictures which may be presented when syphilis attacks the liver, and the severe impairment of the general health which results. But appropriate treatment in time corrects conditions completely, even serious changes in the liver tissue retrogressing so that full functional capacity is restored. The syphilitic nature of the liver trouble is liable to be overlooked and as long as this is the case suitable treatment is not applied. In some cases early in the second stage of syphilis symptoms develop of what seems to be ordinary catarrhal jaundice; they may subside and return or keep up for a long time. The jaundice is caused sometimes by swelling of the portal lymph glands, thus compressing the outlet for the bile. In other cases the catarrhal affection is restricted to the bile ducts. The liver with syphilitic jaundice is usually enlarged, smooth, often tender, and the spleen may be enlarged likewise without ascites, and there may be fever of a variable type. Symptoms of cirrhosis of the liver may appear and if the tissues around become inflamed there may be violent pains. Sometimes the pain with syphilitic disease in the liver simulates in every respect actual gall-stone colic; this has led to useless operations in numerous instances on record. The cirrhosis sometimes develops without jaundice; the liver is large and smooth but not tender and there may be no congestion in the portal domain. The spleen may be enlarged from the same characteristic tendency to proliferation of connective tissue and there may be anemia, the clinical picture thus simulating splenic anemia or pseudoleukemia. In some cases the liver is found small and hard and knobby, the spleen enlarged, with ascites and anemia—the whole thus deceptively resembling Banti's disease. In other cases the liver is hard and shriveled, with a knobby surface as in typical Laennec's cirrhosis; this form is generally found in connection with abuse of alcohol. Deep grooves may cut the liver into queer shapes, and there may be inflammation around with adhesion to the parietal peritoneum. When this is the case the assumption of cancer seems justified, except that the spleen is usually enlarged also and that the trouble does not progress so rapidly as malignant disease. Particularly in the young, syphilis is liable to entail gummatous growths in the liver; it grows large and tough, protruding at unusual points, with much pain and fever.

Still another clinical picture is that from inflammation of the walls of the portal vein and vicinity, with thrombosis and shriveling, followed later by stasis in the portal domain, ascites, and hemorrhoidal hemorrhages, while the liver keeps small and soft.

When the vicissitudes of a campaign are superposed on these clinical pictures, the outlook is serious unless specific treatment is applied at once. A vigorous course of iodid and mercury can do no harm in any event, and the result may be a complete cure. He warns to be very cautious with salvarsan in cases with fever and jaundice, as acute atrophy threatens; under other conditions an intravenous dose of 0.2 gm. salvarsan once a week is usually borne without harm and may transform the clinical picture. The diet must be restricted as usual with liver affections.

The pancreas and kidneys may likewise be affected with the syphilitic proliferation of connective tissue, and glycosuria up to severe diabetes mellitus may develop in consequence. Cases are comparatively frequent of mild syphilitic interstitial pancreatitis with cirrhosis of the liver, or syphilitic interstitial nephritis leading to secondary contracted kidney.

Syphilitic affections of the aorta and other vessels seldom retrogress so completely under specific treatment as the liver and pancreas affections. Prophylaxis here is the main thing, seeking to stamp out the syphilis in time, and to avoid physical strain and abuse of alcohol or tobacco. Gummas develop by preference where the tissues have been injured or overworked.

64. **Trauma and Tuberculosis.**—Mayer was unable to find in his experimental research any evidence indicating that blood-borne tubercle bacilli located by preference at a point in the lungs previously injured by trauma. But trauma reduces the resisting powers in general and thus favors the development of pulmonary tuberculosis, just as chilling, hunger, fatigue, etc., lower the barriers to infection. It follows from these premises that pulmonary tuberculosis may develop as the result of trauma even when the trauma did not act on the lungs. Peripheral injuries may be responsible for the development of pulmonary tuberculosis; that is, the disease might not have developed if it had not been for the trauma.

Mitteilungen a. d. Grenzgeb. der Med. und Chir., Jena

XXVIII, No. 2, pp. 213-414. Last indexed August 15, 1914, p. 614

65 *Chronic Thyroiditis and Exophthalmic Goiter. (Operationstod bei Thyreoiditis chronica; Beziehungen zwischen Basedowscher Erkrankung und Thyreoiditis.) H. Brunger.
66 *Serodiagnosis of Cancer. (Zur Carcinomdiagnose mittels des Abderhaldenschen Dialysierverfahrens.) S. Cytronberg.
67 Mechanism of Kidney Functioning. (Experimentelle Studien über die Funktion gesunder und kranker Nieren.) W. Baetzner.
68 *Factors in Coagulation of the Blood. (Gerinnungsfaktoren des hämophilen Blutes.) A. Fonio.
69 *Treatment of Myxedema. (Einfluss von Jod, Jodkalium, Jodothyrin und jodfreiem Strumapräparat auf den Stickstoffwechsel, auf Temperatur, Pulsfrequenz und auf das Blutbild von Myxödem.) H. Frey.
70 *Ulcerative Colitis. A. Albu.

65. **Chronic Thyroiditis Explains Death at Operation.**—Brünger's two patients were women of 35. The first required an operation for hernia; the other was operated on to relieve mild exophthalmic goiter. The first died as the general anesthesia was just commenced. In the second case the anesthesia was with scopolamin, an opium preparation and eucain, but the patient never roused, and the fourth hour the respiration became very slow, only twice in thirty-five seconds for a time. As the breathing improved the pulse grew worse, and death ensued sixteen hours after the operation. The thyroid was not much enlarged and only on one side. The first patient had had mild exophthalmic goiter diagnosed years before but it had apparently retrogressed completely long ago. In both cases, however, the thyroid showed changes typical of Basedow's disease and also of chronic inflammation and hyperemia. The findings in these

cases and in a thyroid removed from another patient confirm the analogy between Basedow's disease and Bright's disease. The various phases of the inflammation in the thyroid correspond to the changes in the kidneys which entail Bright's disease. In the above cases there was pronounced lymphocytosis and the ovaries were abnormally large. The first patient was of the type called status lymphaticus, the other status thymicus, as, although the thymus was not palpable yet it was abnormally large for the age.

66. **Serodiagnosis of Cancer.**—Cytronberg urges further study to avoid the present sources of error in Abderhalden's dialysis method of differentiating cancer. Even allowing for the present imperfections in the technic, there can be no question that it is highly specific especially with incipient cancer. Before accepting a reaction as negative, he applied the test with another specimen of cancer tissue and sometimes obtained then a positive response. Tissue from a solid cancer particularly rich in cells gives the most instructive reaction. The work issues from Goldscheider's service (Berlin) and the clinical details are compared with the results of the test in 97 cases including thirty-five certain and five of suspected cancer. The tabulated findings show remarkable unanimity in the different groups, especially the digestion of cancer tissue alone in the cancer group and of pancreas tissue alone in the group of diseases of the blood-producing organs.

68. **Factors in Coagulation of Blood.**—Fonio refers to hemophilic blood in particular as his further research has confirmed that the blood platelets are actively concerned in coagulation and that the red and white corpuscles are only passively enmeshed in the clot. The platelets in the blood of a hemophiliac are not below but are rather above the normal figure. According to his experience, about 350,000 is the average figure in health. The platelets from a hemophiliac seem to be less capable than from a normal person. When added to hemophilic blood they do not hasten clotting, but, strange to say, they do when added to normal blood, hastening the clotting even more rapidly than in normal conditions. These facts and others learned in his research demonstrate, he says, that the blood in hemophiliacs contains thrombogen in normal amounts and power but that the reaction between it and the platelets is insufficient because some element is lacking in the latter, and it is our task now to discover and supply this lacking element. The fact that the platelets were in normal numbers or above in one hemophiliac with 22 per cent. hemoglobin and only 2,036,000 reds, suggests that the production of the reds and of the platelets occurs at different points. The hemophiliac whose case is described in detail was of the fourth generation of a bleeder family. In purpura and similar hemorrhagic affections the number of platelets is abnormally low (149,048 and 0 in two cases cited), but the platelets seem to be normal in themselves. This difference in the platelets content may serve to differentiate such affections from true hemophilia.

69. **Influence of Iodin, Etc., on Myxedema.**—Frey gives the detailed findings in myxedema in a young woman and a girl of 10 given systematic courses in turn of iodin, potassium iodid, iodothyrin and of an iodin-free extract of goiterous thyroids. The metabolism, temperature, pulse and clinical picture of the myxedema were recorded from day to day over long periods. The research was done in Kocher's service and is practically a continuation of work along much the same lines in 1911. Iodin alone transformed the blood picture while thyroid extract free from iodin was entirely ineffectual in this line. Iodothyrin acts more powerfully than iodin alone. The neutrophils increased by 11.8 and 12 per cent. under the iodin and by 29 and 14 per cent. under the iodothyrin. The lymphocytes decreased by 15.8 and 14 per cent. under iodin and by 27 and 12 per cent. under iodothyrin. The effect was most pronounced in the younger patient. It was so striking that it suggests a possible benefit from iodin and iodothyrin in other pathologic conditions accompanied by lymphocytosis, such as the lymphoid form of leukemia.

70. **Ulcerating Colitis.**—Albu has encountered two acute and twenty-one chronic cases of ulcerative colitis, and comments on the remarkable lack of cicatricial changes afterward in the intestinal mucosa. Only when the ulceration had been unusually extensive or had burrowed very deep was there much scarring, but the mucosa showed striking anemia over large areas and it was sometimes hard and thick like leather. Treatment requires much perseverance on the part of both physician and patient; bed-rest, food that spares the bowels as much as possible, and astringents applied to the mucosa are the main features of treatment. A mixed albumin and vegetable diet has proved the best for these cases, the food all fluid or soft mashed, with gelatin in the form of meat, milk and fruit jellies. For local application he prefers a dry astringent powder applied through the rectoscope. When the latter is not available, a suspension of an astringent in ¼ liter tepid water can be injected. The enema is retained for twenty or thirty minutes. The mucosa must be thoroughly cleaned each time before the local procedure, flushing it abundantly through a two-way tube with a warm dilute soda solution. Gradual improvement and sometimes a complete cure was realized by these measures. In a few others the colitis recurred and the patients were finally cured only by making an artificial anus on the right side to leave the diseased gut at rest except for systematic flushing with astringent solutions from above. This required a year in one case; another patient still has his artificial anus after four years as every attempt to close up the opening has brought back the trouble anew. In the two cases in which the appendix fistula or artificial anus was closed after several months, the stools still show traces of blood and pus, and after every error in diet the condition becomes aggravated so the patients have to stay in bed for a time. His experience with surgical treatment has not been very encouraging; it should be restricted, he says, to the desperate cases in which almost any attempt to relieve is justified, especially when there are repeated hemorrhages. In a later series of five cases there is constant constipation and the inflammatory process seems to be limited to the ampulla of the rectum and entrance to the sigmoid flexure. A suspension of bolus alba and animal charcoal by the mouth and by the rectum has proved more effectual in his recent experience than anything previously tried in one of his rebellious cases. On a mixed diet there has been no return of diarrhea for five months to date. A tablespoonful of the bolus and animal charcoal mixture in a glass of water is taken half an hour before breakfast, and before this, after the intestine has been rinsed clean with warm soda solution, an injection is made into the rectum of a tablespoonful of the mixture in ¼ liter of warm water. The number of passages and the tenesmus became reduced at once and there was less pus evident. He gives a colored plate to show the typical rectoscope findings with ulcerative colitis.

Monatsschrift für Geburtshülfe und Gynäkologie, Berlin

November, XL, No. 5, pp. 537-652

71 Puerperal Infection from Retention of Remnants of Placenta. **F.** Ahlfeld.

72 Tuberculosis of the Genital Organs in Little Girls. G. Gracfe, Commenced in No. 4.

73 *Does Menstruation Influence Hemolysis by Vaginal Bacteria? Hellmuth.

74 Serodiagnosis of Pregnancy. (Spezifität der Abderhaldenschen Fermentreaktion.) M. Fetzer.

73. **Influence of Menstruation on Hemolysis of Vaginal Bacteria.**—Some authors hold that hemolysis is a specific characteristic of certain very virulent strains of streptococci. Others consider it only an accidental characteristic dependent on the blood content of the nutrient medium. Hellmuth describes in detail a series of experiments undertaken to show whether hemolysis does occur with vaginal bacteria during menstruation, and he finds that it does not. Even in two cases in which metrorrhagia had persisted for weeks, no hemolytic bacteria could be demonstrated. In the three cases in which hemolytic bacteria were found, he thinks that they did not develop during menstruation from non-hemolytic ones, but reached the vagina through invasion or inoculation. He does not feel that he has proved that the faculty of hemolysis could not develop under long continued hemor-

rhage, as for example in cases of myoma, but he thinks his experiments are sufficient to prove that hemolysis is not merely the result of the blood content of the nutrient medium of the bacteria.

Monatsschrift für Kinderheilkunde, Berlin

XIII, No. 5, pp. 205-244

75 *Bronchotetany. E. Wieland.
76 Inanition in a Case of Habitual Luxation of the Lower Jaw in an Infant. (Hungerschädigung bei hab. Unterkieferluxation im Säuglingsalter.) B. Ahrens.
77 *Permanent Results in Calcium Treatment of Spasmophilia. P. Rohmer.
78 Effect of Nutrition and Diseases on the Growth of the Brain in Early Childhood. W. Sawidowitsch.
79 *Vaccination in Chicken-Pox. (Schutzimpfung bei Varicellen.) E. Handrick.

75. **Bronchotetany.**—Lederer described what he called "bronchotetany" in the *Zeitschrift für Kinderheilkunde*, 1913, vii, 1 (abstract in THE JOURNAL, 1913, lx, 1931). The most characteristic feature of it is the extreme dyspnea caused by spasm of the bronchial musculature, preventing the access of air. Wieland describes two new cases from his practice, and concludes that bronchotetany presents a well defined clinical and pathologic picture. It is found in connection with other manifestations of spasmophilia, and careful watch should be kept over all cases of spasmophilia to note the first signs of respiratory involvement. The prognosis, after true bronchotetany has developed, is almost hopeless. Both his cases were fatal, as were Lederer's six. The differential diagnosis from ordinary pneumonia can be made by the Roentgen picture. There are cases of mild or beginning pneumonia, however, that cannot be distinguished in this way. These do not show the sharp shadows typical of lung infiltration. He decribes a case of his own of severe spasmophilia in which lung symptoms suddenly developed and he ascribed them to bronchotetany. The child died after two days and necropsy showed foci of bronchopneumonia in both upper lobes. There are doubtless cases of mild bronchotetany with favorable prognosis, but little is known of them. Cases so diagnosed may be a combination of asthma and spasmophilia of which he describes a case, appending a bibliography of thirteen titles.

77. **Calcium Treatment of Spasmophilia.**—Many authors have found that the effect of calcium was only transitory and stopped as soon as the medicine was discontinued. Blühdorn tried to overcome this by giving very large doses of calcium, 4 to 8 gm. per day, till all symptoms disappeared, and then smaller doses, about 3 gm. for months afterward. But even then when the calcium was stopped the symptoms reappeared. Experiments by Vorhoeve have shown that in adults, as long as calcium was being given, it was stored in the body in increasing amounts, but that as soon as its administration was discontinued, the stored up calcium was gradually eliminated. Birk and Schabad's work has shown that phosphorized cod-liver oil has a specific calcium-retaining effect—a fact which is of importance in the treatment of rickets and spasmophilia. Rohmer therefore used a combination of calcium and cod-liver oil in the treatment of a series of cases of spasmophilia. Tabulated results in eight cases are given. He thinks that these cases prove that the combination of high calcium doses and phosphorized cod-liver oil give better results than any other method of treatment. Generally the spasms stop on the first or second day, and do not reappear when the calcium is suspended. The electric excitability also falls to normal. It is not a temporary symptomatic effect but seems to be a permanent recovery.

79. **Vaccination Against Chicken-Pox.**—Kling reported good results from vaccinating children directly from the vesicles of other children with varicella. He got a local reaction at the site of inoculation and the vaccinated children did not take varicella although they were exposed. Because of his report, Handrick tried the method at the hospital of Magdeburg during two epidemics; 127 children in all were vaccinated, but the results were not good. There was no local reaction and considerable numbers of the children had more or less severe attacks of chicken-pox. Handrick does not attempt to explain the difference between his results and Kling's, but thinks the method is not reliable. (Kling's report was summarized in these columns Dec. 20, 1913, p. 2277.)

Münchener medizinische Wochenschrift, Munich

December 1, LXI, No. 48, pp. 2301-2332

80 Collapse after Naval Battles. (Kollaps nach Seegefechten.) H. Ehret.
81 Puerperal Infection with Gas Bacillus. W. Schüler.
82 Portable Sphygmomanometer. (Ein transportabler Blutdruckmesser.) F. Moritz.
83 Professional Secrecy, the Law and Society Reports. (Die Ausleihung der ärztlichen Krankengeschichten.) M. Fischer. Commenced in No. 47.
84 Gunshot Wounds of the Lungs. Prinz Ludwig Ferdinand.
85 The Russian Bullets. (Ueber die Verwendung von Dumdum- und dumdum-ähnlichen Geschossen seitens des russischen Heeres und über dumdumverdächtige Schussverletzungen.) P. L. Friedrich.
86 *Use of Tincture of Iodin. W. Herzog.
87 Advantages of Peruvian Balsam in Treatment of Gunshot Wounds. (Zur Technik des ersten Wundverbandes im Felde.) A. G. Oberst.
88 Technic for Plaster Cast for Fracture of Femur. (Fraktionierter Gipsverband bei Schussfrakturen des Oberschenkels und Schenkelhalses.) Ritter.
89 Extension Splint for Fractured Arm. (Behandlung von Armbruchen nach Dr. Wildt.) Lambertz.
90 Tetanus. Siemon, W. Usener and E. Teller.
91 *Ultraviolet Ray Destroys Tetanus Germs. (Abtötung der Tetanuskeime am Orte der Infektion durch ultraviolettes Licht.) E. Jacobsthal and F. Tamm.

86. **Warning Against Indiscriminate Use of Tincture of Iodin.**—Herzog has witnessed instances of serious irritation in and around wounds painted with tincture of iodin. Blondes seem to be especially susceptible to this irritation, and severe trouble is liable to follow when the iodin is applied to the wound itself. He regards its use in this way as a long step backward. It should never be used in a stronger solution than 5 per cent., and never more than one coat. As the fluid evaporates, the tincture becomes more concentrated; this should be guarded against. He denounces the use of tincture of iodin in any strength in a recent wound. At the very utmost it might be used to hasten the casting off of necrotic tissue.

91. **Destruction of Tetanus Germs with Ultraviolet Rays.**—Jacobsthal and Tamm of Hamburg report that systematic application of the ultraviolet rays kills tetanus bacilli and the bacilli of malignant edema, as they determined by experiments with a number of jagged and infected wounds. The rays do not reduce the toxicity of the focus, and hence surgical cleansing of the wound is imperative, but the ultraviolet rays supplement most successfully the other measures applied in treating tetanus.

Wiener klinische Wochenschrift, Vienna

November 26, XXVII, No. 48, pp. 1529-1558

92 *Centennial of the Discoverer of the Law of Conservation of Energy. (J. R. v. Mayer.) S. Exner.
93 *End-to-End Suture of Common Carotid after Gunshot Aneurysm; Recovery. H. v. Haberer.
94 *Splenectomy for Pernicious Anemia; Three Cases. (Milzexstirpation bei pernizioser Anämie.) N. v. Jagic.
95 Vienna Physicians and War. (Der Krieg und die Wiener Aerzteschaft. Rückblick auf vergangene Tage.) J. Fischer.

December 3, No. 49, pp. 1559-1582

96 Extension Cast for Fracture of Femur. (Schussfrakturen des Oberschenkels.) J. Hass.
97 *Curability of Chronic "Ankylosis of the Spine." (Die Rigiditat der Wirbelsäule und ihre Prognose.) B. Beer.
98 Bubonic Plague. (Ueber Pest.) Wiene. Commenced in No. 48.

92. **The Medical Discoverer of Law of Conservation of Energy.**—J. R. v. Mayer was a popular and leading physician at Heilbronn when he published in 1845 his discovery of this great law of physics. Two years later another physician, Helmholtz, discovered the law independently. The editor of the chief scientific periodical of the day rejected both communications when offered him for publication. Helmholtz soon won fame by other contributions to science, but he always credited Mayer with the priority of this great law. Mayer later had maniacal attacks requiring institutional

care from 1852 to 1854 and he later returned to the asylum at intervals for brief treatment when he felt his excitement returning. His experiences in the asylum led to important reforms in the treatment of the insane. His text in his writings on this subject were "Let the patient's reaction run its course." (*Man müsse den Patienten abreagieren lassen.*)

93. **Suture of Common Carotid.**—The bullet passed through the upper jaw near the left nostril and out through the center of the right sternocleidomastoid muscle. Except for hoarseness and stiffness of the neck, the young man was not inconmoded until the resulting aneurysm had become as large as a goose egg. Even then there were no brain symptoms. The details of the technic of the operation two months after the injury are given as the first successful case on record of circular suture of the common carotid for aneurysm.

94. **Splenectomy in Pernicious Anemia.**—The results of the splenectomy in the three cases reported demonstrate anew that while this evidently does away with some of the elements of the clinical picture yet it does not remove the cause. The general condition improved at once. The patients have gained over 17, 24 and 26 pounds in the seven, eleven and nine months since and feel well and strong, but the blood picture is still of the pernicious type with little improvement. In the third case, after a period of improvement, conditions began to grow worse again, but under arsenic the former improvement returned and progressed.

97. **Ankylosis of the Spine.**—Beer points out the differences between Strumpell's chronic ankylosing spondylitis, Marie's *spondylitis rhizomélique* and Senator's myogenic cases of ankylosis of the spine, but adds that the distinction has not often been made, and consequently there is great confusion in the literature on this subject. All proclaim that it is an incurable condition, but he declares that he has succeeded in curing over a dozen cases of what had been diagnosed by eminent authorities as typical examples of one or the other form of ankylosis of the spine. The key to success is the realization of the fact that the articulations are immobilized by changes in the muscles and soft parts and not by primary disease of the vertebrae. In some of his cases the trouble was of from two to fourteen years' duration, but true ankylosis of the articulations did not exist except in the case of one man of 64 who had true ankylosis of three of the dorsal vertebrae. His patients were all in private practice, not accustomed to manual labor and hence they escaped injury of the articulations from trauma from abnormal functional use as the vertebrae are drawn out of place by the affection. He reiterates that the trouble is easily cured even when it is of long standing and the patients are over 50, but chronic affections require chronic treatment, and the simple and gentle mechanical measures he has found effectual require long patience and perseverance on the part of both patient and physician. His special intent in calling attention to his success in this line at this time is to start an agitation in favor of founding establishments where old crippling affections can receive the proper treatment, adding "the waves of battle now breaking over Europe will leave behind them an imposing number of apparently incurably crippled men who yet can be restored to normal life by suitable patient treatment over weeks or months." Systematic efforts to improve the lot of the apparently crippled will soon be imperatively needed on a large scale.

Zentralblatt für innere Medizin, Leipzig

November 28, XXXV, No. 48, pp. 1033-1048

99 *Technic and Art in Dietetics. (Die Technik der Diätküche und die industrielle Technik der Fabrikation von Gemüsepulver.) W. Sternberg.

99. **Technic and Art of Dietetics.**—Sternberg has long emphasized that the proper number of calories and the utilization of the food in the digestive tract are far from representing all the factors in suitable nourishment. (His views were commented on in a recent editorial Dec. 26, 1914, p. 2296). The food must appeal to the eye, the nose, the taste, and also, by its variety, to the mind. The cooking and especially the warming over of food induce chemical changes which may escape our methods of chemical analysis but are evident to our "chemical sense," the taste. Funk's assumption of vitamins he thinks is merely a recognition of the importance of flavor, and he reiterates that flavor depends in large measure on the food being eaten when it is ready. The flavor soon vanishes when the dish is not eaten at once. In preparing food for the sick, the necessity for retaining the flavor should be met by having the kitchen as near to the serving room as possible. In conclusion he remarks that many dieteticians overestimate the chewing capacity of even the most perfect teeth. The food should be prepared by the technic of the best chefs, that is to say, purées of vegetables, for example, should be passed through a hair-fine sieve. He denounces as unphysiologic the desiccated pulverized vegetables now on the market, and also denounces the vitamin theory as based on false premises.

Gazzetta degli Ospedali e delle Cliniche, Milan

November 26, XXXV, No. 129, pp. 1989-2004

100 Artificial Pneumothorax. A. Pisani.

November 29, No. 130, pp. 2005-2020

101 *Sweetened Condensed Milk to Cure Uncontrollable Vomiting of Infants. (Il vomito dispeptico dei lattanti guarito col latte condensato zuccherato.) V. Fusco.

December 3, No. 131, pp. 2021-2036

102 *Albuminuria Without Nephritis. A. Barlocco.
103 Autoplastic Restoration of Abdominal Wall in Treatment of Inguinal Hernia. C. Mantelli.
104 Echinococcus Disease of the Lung. A. Cardarelli.

101. **Highly Sweetened Milk in Treatment of Dyspeptic Vomiting of Infants.**—Fusco's experience has not been very extensive, but the results were so striking that he hastens to call attention to them. The infants were from 2 to 11 months old and were becoming much depressed by their uncontrollable vomiting. When he began to feed the children with condensed milk, sweetened, the vomiting ceased and they gained at once. The sugar seems to regulate the torpid bowel functioning and stimulate glandular secretion.

102. **Albuminuria Without Nephritis.**—Barlocco cites numerous authors who ascribe to vasomotor action albuminuria of nervous origin. The vasodilating action of the toxins of the tubercle bacilli is also responsible for the albuminuria noted in what has been called the "pretuberculous stage." Improved methods of investigation have revealed that this in reality is early latent tuberculosis. The albuminuria is intermittent, and generally returns in regular cycles. There is not much albumin and it is found only in the morning. The urine is highly toxic and the salt content is large, especially of phosphates. Teissier has noticed in such cases that when the albuminuria grows less pronounced without improvement in the general health, some tuberculous focus will be found installed in the lungs. On the other hand, some slight and possibly transient weakness on the part of the heart may entail albuminuria. This possibility should always be borne in mind in examining cases of supposed incipient nephritis or so-called idiopathic albuminuria, especially in the laboring classes. The albuminuria may be of the orthostatic or nervous type or of the physiologic type following severe exercise. Analysis of the cases of so-called idiopathic albuminuria on record generally reveals something abnormal in the circulatory apparatus. Martius found the heart inclined to be weak and to stretch in 57 per cent. of his cases of orthostatic albuminuria. Lommel found what he calls growth disturbances in the heart in thirty-five of ninety cases.

Pediatria, Naples

December, XXII, No. 12, pp. 881-956

105 *The White Blood-Count in Inherited Syphilis. L. Chiaravalloti.
106 *Fermentation Test Applied to Infants' Stools. (Sulla prova della fermentazione fecale applicata alla pratica nell'infanzia.) F. Luna.
107 *The Tryptophan Test Applied to Children's Cerebrospinal Fluid. (Sul valore diagnostico della reazione del gliciltriptofano nel liquido cefalo-rachideo dei bambini.) S. Segagni.
108 *Technic for Venesection and Intravenous Injections in Infants. (Technica per il prelevamento di sangue e per iniezioni endovenose nel lattante.) S. Maggiore.
109 Serodiagnosis in Various Diseases. (Studio della prova di Abderhalden.) A. Corica.

105. **The Blood in Inherited Syphilis.**—Chiaravalloti analyzed the blood of 150 children with certain inherited syphilis. The blood was of the anemic type in all, whatever the age or manifestations of the syphilis. The hemoglobin ranged from 12 to 75 per cent., averaging about 56.8. The reds were also usually below the normal proportion. The differential leukocyte count is extremely variable but nothing strictly characteristic was observed. Abnormal findings in the leukocyte count in any direction may confirm the assumption of an inherited taint. Very frequently an inherited taint with both syphilis and tuberculosis was apparent.

106. **Fermentation Test Applied to Infants' Stools.**—Luna states that the fermentation test may sometimes reveal in olerance of carbohydrates escaping all other methods of examination when there is intestinal inflammation. The sound infant intestine eliminates only minute amounts of carbohydrates as waste. Infants with flatulent dyspepsia and positive findings with the fermentation test should be fed very little carbohydrate but much albumin. He tabulates the findings in five typical cases showing the prompt improvement under dietetic treatment on these premises.

107. **The Tryptophan Reaction in Children's Cerebrospinal Fluid.**—Segagni reports that in eight cases of tuberculous meningitis, one of cerebral hemorrhage and one of a cerebellar tumor, the tryptophan reaction was constantly negative.

108. **Intravenous Injections in Infants.**—Maggiore confirms the advantages and the convenience of selecting the external jugular vein as the one to puncture in drawing blood or for intravenous infusion. The child lies on his back, the head turned away and held by another person. He uses a needle and rubber tube and bulb rather than a syringe, and says that the large branches of the vein can be utilized in the same way in case it is necessary to repeat the puncture.

Policlinico, Rome

November 22, XXI, No. 47, pp. 1633-1664

110 No Apparent Change in Mind or Character after Removal of Right Frontal Lobe of Boy of 14. (Di una lesione traumatica del lobo frontale destro.) T. Lucherini.

November 29, No. 48, pp. 1667-1704

111 Mechanism of Production of Tube-Casts in Urine. (La genesi e la natura dei cilindri granulosi e ialini, chiarite mercè un nuovo metodo di ricerca.) C. Minerbi.
112 Typhoid in District Near Rome. P. Cataldi.
113 Sugar Solutions in Therapeutics. (L'uso dei sieri zuccherati in terapia.) G. Sabatini.

Riforma Medica, Naples

November 21, XXX, No. 47, pp. 1289-1316

114 *Pathogeness of Peptic Ulcer. R. Crescimone and B. Anglesio.

114. **Anemia a Factor in Peptic Ulcer.**—Crescimone and Anglesio induced anemia in dogs by daily subcutaneous injection of 1 per cent. solution of pyridin. By the tenth day the hemoglobin had dropped to 25 or 30 per cent. and the reds to about two million. The anemia continued a progressive course, the animals dying between the tenth and forty-fourth day with one exception. In fifteen of the sixteen animals lesions were found in the stomach or duodenum or both and nowhere else. These lesions displayed the characteristics of peptic ulcers, and they regard them as analogous to the first stage of chronic ulcer in man. In some of the dogs the vagus had been severed, and this seemed to aggravate the lesions. The experiments reported and the literature reviewed seem to sustain the assumption that an anemic condition is an important factor in gastric or duodenal ulcer, and that treatment of the peptic ulcer should not disregard the underlying anemia.

Brazil-Medico, Rio de Janeiro

October 15, XXVIII, No. 39, pp. 365-372

115 Mycosis with Red Saccharomyces; Seven Cases. (Mycose humana. "Saccharomyces rubrum endothrix" n. sp.) O. Magalhães.

Hospitalstidende, Copenhagen

November 25, LVII, No. 47, pp. 1393-1416

116 Light as a Stimulant for Metabolism. (Et grundincitament i den interne Medicins fysiske Terapi. Lyset som stofskifteincitament.) V. Rubow.

Norsk Magazin for Lægenvidenskaben, Christiania

December, LXXV, No. 12, pp. 1369-1508

117 *Effect of Digitalis on the Heart and Kidneys. (Digitalisvirkninger.) P. F. Holst.
118 *Abnormal Accumulations of Serous Fluid Share in Circulation. (Deltar hydroper i legemets væskecirkulation?) O. Scheel.
119 Epidemiology of Scarlet Fever and Diphtheria at Christiania. (Smitteforhold i Kristiania ved skarlagensfeber og difteri.) O. Lorange.
120 Salvarsan in Frambesia. J. Cammermeyer.
121 *Salvarsan Alone in Syphilis; Four Years' Experience. R. Krefting.
122 *Etiology of Dementia Praecox. (Aarsaken til dementia præcox.) B. Ebbell.

117. **Action of Digitalis.**—Holst discusses the history of and reviews recent literature on this subject and then relates a number of unusual cases to show the action of digitalis in different conditions. It may have a diuretic action without or before manifesting any influence on the heart. Some patients can stand remarkably large doses; one man of 60 took 7.3 gm. of digitalis in twenty-two days with great benefit and no apparent by-effects. Another patient, a telegrapher of 22, developed symptoms of heart-block with Adams-Stokes phenomenon during the course of acute articular rheumatism, and the symptoms grew worse under a dose of digitalis but subsided entirely an hour after subcutaneous injection of 2 mg. atropin, and complete recovery followed.

118. **Effusions, Etc., Share in Circulation.**—Scheel injected 0.10 gm. of methylene blue into the pleural effusion of a woman with severe valvular disease. The urine voided the next day and for seven more days was highly colored by the stain, showing that the pleural effusion participates in the circulation, even when it is impaired as seriously as in this case. This assumption was further confirmed by the discovery that the edema fluid in the legs was also tinted by the stain. In other patients similar tests were made with 1 gm. hexamethylenamin, by the mouth and with urea, showing that each passes into the edema and pleural effusion in a very few hours. A dropsical accumulation therefore must be regarded as a flowing stream instead of a stagnant pond.

121. **Four Years of Exclusive Salvarsan Treatment of Syphilis.**—Krefting never had any threatening by-effects from the salvarsan in the 718 cases of syphilis in which he has given it, and all but 3 were outpatients, and the drug was given by intravenous infusion. The cure was so complete in 10 cases that the men have acquired syphilis anew since. In the 221 cases of primary syphilis, 3 were given at least three injections and 70 only one or two—all with a two weeks' interval and with doses of 0.5 to 0.6 gm. for men and 0.3 to 0.4 gm. for women. His experience teaches, he says, that salvarsan is just as effectual alone as when combined with mercury, and that there are no actual contra-indications.

122. **Dementia Praecox and the Thymus.**—Ebbell presents evidence which seems to demonstrate a connection between some primary anomaly or acquired disorder of the thymus and the development of clinical symptoms of the dementia praecox type. The pathologic anatomic findings in dementia praecox, he continues, seem to be identical with those found in animals after partial destruction or total removal of the thymus. This assumption of thymus insufficiency as the cause of dementia praecox harmonizes with the observation of its hereditary nature and with the influence of acute infectious diseases and abuse of alcohol. When the dementia praecox develops in childhood there may be some congenital deformity of the thymus. Attempts to treat animals and human beings with thymus extract or in substance have given no results. This is but natural, Ebbell remarks, as an artificial chemical mixture or devitalized tissue is unable to do the work of the living thymus. Transplantation of thymus tissue seems the only encouraging prospect, and progress must be sought along this line, although Klose and Vogt have reported disappointing results in two dogs; scraps of thymus tissue were implanted in the omentum and spleen of two thymectomized dogs but the scraps were all absorbed in time.

Ugeskrift for Læger, Copenhagen

December 10, LXXVI, No. 50, pp. 2117-2144

123 Research on the Precipitin Reactions. (Fældningsreaktioner.) H. I. Bing and H. Trier.